

THE ROLE OF SOCIAL RELATIONSHIPS IN DIET QUALITY AND OBESITY
AMONG URBAN, LOW-INCOME, AFRICAN AMERICAN ADOLESCENTS

by
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ABSTRACT

Adolescent overweight and obesity rates are alarmingly high, and experts have called for multi-level, systems-oriented interventions to address this significant public health issue. Researchers have identified links between adolescents' eating behaviors, weight status, and physical activity patterns and those of their parents and/or their friends. However, there is a significant gap in the literature related to in-depth knowledge about how parents, friends, and other social contacts interact with youth around nutrition and physical activity, including the types of social support they provide; and how to best implement and evaluate youth-led intervention components within larger interventions.

The B'More Healthy Communities for Kids study (BHCK) is a multi-level, systems-oriented obesity prevention intervention that targets low-income, urban, African American youth (age 10-14) in Baltimore City, Maryland. BHCK was designed to intervene at multiple levels of the food system and environment to promote healthier eating choices. This thesis is a sub-study of BHCK, and is the first study to conduct in-depth explorations of the roles of multiple social relationships on urban, minority adolescents' eating and physical activity habits, and to implement and evaluate a youth-led intervention uniquely positioned within a multi-level obesity intervention.

Multiple research paradigms and methods were used in this thesis. Quantitative surveys were completed with 297 low-income urban African American youth to assess demographics, anthropometrics, dietary intake, social support, and perceptions of change agents (i.e., influential individuals who could be engaged to aid in behavior

change efforts). In-depth interviews were completed with 38 youth, 10 parents, and 16 youth-leader participants to assess the perceived roles and interactions that various social contacts have with youth surrounding eating and physical activity habits, and to assess the impact of the youth-leader intervention. Pre- and post-intervention surveys were completed with the 16 youth-leaders and a comparison group of 10 young people to assess changes over time in dietary intake, psychosocial factors, and leadership skills within and between the two groups.

The results of this study identified that youth have multiple social contacts that interact with them around nutrition and physical activity. Parents and grandparents play multiple roles and have multiple interactions with youth related to eating and activity, and are generally supportive of healthier behaviors. However, some youth also experienced social support for unhealthy eating from their parents, which may be related to lower diet quality. Other social relationships have semi-distinct roles that guide their interactions with youth around nutrition and physical activity. Friends serve as individuals who participate in physical activity with youth, while aunts and other family members provide novel food experiences, and professionals (teachers, doctors/nurses) provide information on nutrition and physical activity to youth.

The BHCK youth-led intervention involved 16 Baltimore-based college students who served as youth-leaders and delivered a total of 98 nutrition interventions sessions to younger youth participants in seven participating Baltimore City recreation centers. The youth-leaders identified and described specific ways in which their participation in the BHCK intervention influenced the health behaviors of themselves, the youth-

participants and others, with quantitative evidence showing that the intervention youth-leaders experienced statistically significant increases in their behavioral intentions for healthier eating relative to a comparison group.

These results provide important information related to designing strategies and implementing social environment changes within the context of systems-oriented interventions focused on urban, African American youth. First, researchers and interventionists should be mindful of the potential for youth to be receiving social support for unhealthy eating behaviors, and that this is particularly concerning when coming from parents. Second, social relationships play unique roles related to nutrition and physical activity with youth, and social environment interventions should consider enhancing the existing health-promoting roles that social relationships provide. Third, one potential way to intervene in the social environment is to engage youth-leaders to deliver highly interactive nutrition intervention sessions to youth in community settings.

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CHAPTER 1: INTRODUCTION

1.1 PROBLEM STATEMENT

Childhood and adolescent overweight and obesity rates in the United States have increased rapidly over the past three decades^{1,2}. Although there is evidence that the rates have reached a plateau in recent years^{2,3} and have even declined among select sub-groups^{4,5}, rates are still alarmingly high with more than 35.0% of youth ages 12 to 19 classified as overweight or obese². What is particularly concerning is that obesity disproportionately affects certain sub-populations of youth; with low-income, and racial and ethnic minority youth experiencing higher rates of obesity than higher income white counterparts^{2,6,7}.

From a simplistic perspective, weight status is driven by the balance between energy intake and expenditure. However, there are complex, interconnected relationships that influence those energy balance behaviors. Initial obesity interventions often yielded minimal results because they narrowly focused on one or a limited number of obesity-related factors⁸. Advances in science and understanding of obesity have caused leading researchers to call for interventions that address multiple obesogenic factors in a systems-oriented approach where interconnected intervention components drive synergistic change on multiple levels including both the physical and social environment^{9,10}.

Several studies have identified relationships between obesity and the physical and the social environment. Related to the physical environment, having a high density

of small retail food outlets and prepared food sources, and a low density of grocery stores is related to obesity and higher chronic disease rates^{11–14}. Related to the social environment, cross sectional studies have identified that weight-related behaviors tend to cluster among social networks, such as similarities in weight status and eating behaviors of youth and their parents^{15,16} or among friendship groups^{17,18}. Some social factors that influence obesity-related behaviors (i.e., social modeling^{16,19}, social norms^{15,20}, impression management²¹) have been identified, but a comprehensive understanding of the mechanisms through which social relationships facilitate the spread of obesity remains unknown and under-researched²². Therefore, the best strategies for intervening in the social environment have yet to be determined.

Intervention strategies related to the social environment maybe particularly important when addressing obesity in early adolescents (ages 10-14), because early adolescence is a life stage when perceptions of others are highly valued, and there is a strong urge to conform to social norms^{23,24}. Early adolescence is also a period of shifting social dynamics. For example, adolescents begin spending more time in the presence of peers and friends^{23,25}, and gain autonomy in their food-related decision-making, including having increased access to money to independently purchase foods²⁶. From a health perspective, adolescence is also crucially important because obese adolescents are more likely to become obese adults²⁷.

The B'More Healthy Communities for Kids study is a multi-level obesity prevention intervention that targets low-income, urban, African American youth ages 10-14 in Baltimore City, Maryland. The BHCK intervention works to intervene on

multiple levels including the policy, retail food (wholesaler, corner store, carry-out), youth-leader, family, and individual child levels²⁸. A significant amount of work has gone into developing and refining retail food interventions in Baltimore^{29–31}, but there is a dearth of research related to the impact of intervening on social relationships using youth-leaders within a multi-level intervention³².

The overarching goal of this study is to assess aspects of multiple social relationships on dietary behaviors among urban, low-income African American adolescents in Baltimore City using several complimentary research methods and strategies, and to develop, implement and evaluate a social environment intervention delivered by youth-leaders within the multi-level BHCK parent study. The research aims of this study are as follows:

Research Aim 1: *To evaluate the relationship between youth’s perceived social support for healthy and unhealthy eating behaviors provided by their parents and friends and diet quality.*

Research Aim 2: *To conduct a mixed methods research study including a cross-sectional survey questionnaire along with in-depth interviews from youth and adult caregivers to assess the roles and interactions that social contacts have with low-income urban, African American youth around eating and physical activity, with the goal of developing a culturally informed, obesity prevention program for low-income, African American youth in Baltimore that incorporates social relationships into the intervention.*

Research Aim 3: *In a participatory process with youth, to implement and evaluate a youth-led nutrition intervention delivered primarily in Baltimore City recreation centers,*

as part of the BHCK multi-component intervention.

1.2 SUMMARY OF DISSERTATION CHAPTERS

This dissertation contains of seven chapters, beginning with this introduction. The second chapter (Chapter 2) provides a comprehensive review of the literature related to childhood obesity, adolescent nutrition, the influences of the social environment on eating and physical activity behaviors, and youth-led nutrition interventions. Chapter 3 provides an in-depth description of the research methods used in this dissertation, including information related to description of the study designs, data collection, procedures, and analyses for each of the three sub-studies in this dissertation; a timeline for the research; funding acknowledgments; and a discussion of the ethical considerations of the study.

Chapter 4 (Paper 1) describes a cross sectional analysis of the BHCK baseline data. In this study, multiple linear regression analyses are used to assess the relationships between the outcome measure of interest, diet quality measured by the Healthy Eating Index-2010 (HEI), and the independent variables of support for healthy eating from parent and friends, and support for unhealthy eating from parents and friends. The results indicate a statistically significant inverse relationship between parent support for unhealthy eating and adolescents' diet quality. The target journal for this paper is the *Journal of Nutrition Education and Behavior*.

Chapter 5 (Paper 2) is a mixed methods assessment of the roles and interactions that multiple social agents have with low-income, urban, African American youth related to nutrition and physical activity behaviors. This study triangulates the results of 48 in-

depth interviews with youth and their parents, with the results of 297 youth who responded to a structured questionnaire assessing roles of ‘change agents’ (individuals who could be engaged in obesity prevention interventions to support health behavior change for youth) with the purpose providing in-depth information on the semi-distinct roles that various social contacts play. Based on the results, a framework for understanding the interactions and social roles of multiple relationships is presented along with recommendations for things to consider when designing social environment interventions in this population. The target journal for this manuscript is the *Journal of Mixed Methods Research*.

Chapter 6 (Paper 3) reports the results of the evaluation of the youth-led intervention components in the BHCK study. Evaluation components include descriptive information about the characteristics of the 16 Baltimore-based college students who served as youth-leaders, and the intervention delivery; narrative descriptions of the youth-leader’s perceptions of the study’s impact on themselves, the youth participants, and others; and an assessment of the changes over time seen in the youth-leaders versus a comparison sample of youth related to dietary intake, psychosocial factors, and leadership skills. The target journal for this manuscript is *Health Education and Behavior*.

Chapter 7 is the final chapter in this dissertation. This chapter provides a summary of the main findings from each of the sub-studies included in this dissertation, along with acknowledging the strengths and limitations of this body of research. The chapter concludes with a discussion of the future research needed in this important

area and practical implications for researchers and practitioners to consider as they design new programs and interventions.

This study was funded through multiple mechanisms. Primary funding came from the Global Obesity Prevention Center at Johns Hopkins. Supplemental funding came from the Academy of Nutrition and Dietetics through the Champions for Healthy Kids and PepsiCo Healthy Lifestyles Innovation grants.

CHAPTER 2. LITERATURE REVIEW

This chapter reviews the literature relevant to this thesis. The literature review starts with a description of the burden of childhood and adolescent obesity, the nutritional needs versus current dietary intakes of adolescents, and a discussion of adolescent social and cognitive development related to eating behaviors. This is followed by a description of the causes and consequences of adolescent obesity, and the conceptual framework used to guide this research. The chapter concludes with a discussion of pediatric and adolescent obesity prevention interventions with a focus on youth-led initiatives.

2.1 BURDEN OF OBESITY IN U.S. CHILDREN AND ADOLESCENTS

Childhood and adolescent overweight and obesity rates (with overweight and obesity being defined as being at or above 85th or 95th percentiles on the U.S. Centers for Disease Control and Prevention BMI-for-age growth charts³³) in the United States have increased rapidly over the past three decades^{1,2}. Although there is evidence that the rates have reached a plateau in recent years^{2,3}, and have even declined among select sub-groups^{4,5}, rates are still alarmingly high with more than 20.5% of youth ages 12 to 19 classified as obese and an additional 14.5% classified as overweight^{2,34}.

Childhood and adolescent obesity disproportionately affects certain segments of the population. African American youth experience higher rates of overweight and obesity compared to their white counterparts, with 22.1% of non-Hispanic black youth ages 12 to 19 years classified as obese, compared to 19.6% of non-Hispanic white

youth². In addition, non-Hispanic black children experience extreme obesity (falling above the 97th percentile on BMI-for-age growth charts), much more often than non-Hispanic white children with rates of 18.6% and 9.8%, respectively¹.

Socioeconomic (SES) status is another important determinant of obesity status. Often obesity and SES levels have an inverse relationship; however, this is not always the case due to the relationship's complicated nature⁶. For example, higher SES is protective against childhood obesity in non-Hispanic whites, but this protection is not consistent among minority populations^{35,36}. Some research indicates that inclusion of socioeconomic variables, such as parental education, income, and neighborhood factors, attenuates the differences in obesity rates between different races/ethnicities,^{37,38} but additional research in this area is needed. The current literature consistently shows that low-income, African American youth experience problematically high rates of overweight and obesity, in excess of what is seen in their higher income, non-Hispanic white counterparts^{6,7}.

According to the 2013 Youth Risk Behavior Survey (YRBS), overweight and obesity rates among African American High School students in Baltimore City have decreased slightly from the last measurement (taken in 2007), with rates of overweight going from 20.3% to 18.8%, and obesity rates going from 18.8% to 17.7%³⁹. This is similar to the patterns seen among youth in other cities⁵. Despite this improvement, rates of overweight and obesity among African American youth in Baltimore remains above the national average³⁹ and continues to be a primary threat to the health of young people in Baltimore. ***Despite recent successes in reducing childhood obesity***

rates among select groups, obesity remains a major public health concern among children and adolescents, especially low-SES, racial and ethnic minority groups. The literature lacks effective, large-scale obesity prevention and treatment programs that are able to address obesity and health disparities in these high-risk populations.

2.2 NUTRITIONAL NEEDS AND CURRENT DIETARY INTAKES OF ADOLESCENTS

Adolescence is a time of rapid physical, cognitive, social, and lifestyle change. The amount of growth that occurs in adolescence is second only to the amount of growth that occurs in infancy⁴⁰. In normal adolescent growth, individuals are expected to gain up to 50% of their ideal adult weight and 15-20% of their adult height^{41,42}. To allow for appropriate physiological changes to occur, energy, protein and micronutrient needs all increase during adolescence, with a specific importance placed on intakes of calcium (to allow for maximal bone mass development) and iron (particularly in females post-menarche)⁴². According to the Dietary Guidelines for Americans 2010⁴³, girls ages 9-13 and 14 to 18 need to consume approximately 1,400-2,200 and 1,800-2,400 calories per day during puberty, respectively. Pubertal boys ages 9-13 require approximately 1,600-2,600 calories per day, and boys ages 14-18 need approximately 2,000-3,200 calories per day. These estimates are general, keeping in mind that youth who are physically active may need to increase intakes even further⁴⁴.

Inadequate or inappropriate nutrient intakes during this period can lead to slower gains in height, early or delayed onset of pubertal maturation, iron deficiency, obesity, dental carries, and lower peak bone mass⁴⁵⁻⁴⁷. Currently U.S. adolescents' diets are not aligned with recommended intakes⁴⁸; however, despite these inadequate

intakes, overt deficiency in this population is seldom seen at levels that impact routine functioning⁴⁵.

Nation-wide, youth consume diets lacking fruit, vegetables and whole grains and over-consume energy-dense, sugary, and salty foods⁴⁸. Similar to the trends in obesity, these negative dietary patterns are intensified among low-income, African American youth⁴⁹. In a previous study low-income, urban, African American youth reported consuming high intakes of snack foods and sweetened beverages, which contributed to lower diet quality scores when compared to a pre-dominantly white, national sample⁵⁰. Baltimore City youth report consuming similar eating patterns, with high rates of youth reporting that they consume soda (77.9% reporting consumption of at least one soda within the past 7 days); and low rates of youth reporting that they consume fruit and vegetables (11.7% and 14.6% report consuming no fruit/100% fruit juice and vegetables within the past 7 days, respectively)³⁹. A study of the food purchasing habits of low-income, African American youth in Baltimore, found that chips, candy and soda, were the top three items that youth bought for themselves on trip to the store²⁶.

Consumption of a diet high in snacks, sugar-rich foods, and sweetened drinks is associated with increased weight gain and obesity, while diets that incorporate more fruits and vegetables are associated with decreased risk of obesity-related chronic disease^{51–58}. ***There is a significant need for nutrition interventions in low-income, urban, minority adolescent populations considering their poor dietary intake and high prevalence of overweight and obesity. Future nutrition interventions, including the BHCK study, should consider ways to help youth achieve a healthy weight and to***

improve diet quality to insure healthy growth and proper physical development during adolescence.

2.3 ADOLESCENT SOCIAL AND COGNITIVE DEVELOPMENT AND EATING BEHAVIORS

In addition to the physiological changes associated with adolescent physical maturation there are several concurrent psychosocial changes, the combination of which has the potential to put adolescents at nutritional risk⁵⁹. During adolescence, youth gain autonomy in their food choices, consume more food away from home⁶⁰, and are beginning to have small amounts of money which enables them to purchase food independently^{26,61}. Because youth are spending less time with their parents and more time in the company of their peers²⁵ adolescents' choices and behaviors may be increasingly influenced by their friends, peers and other social contacts outside of the home²³. Early adolescents (often defined as 10-14 years old²³) are particularly likely to be influenced by their peer's food choices because they are highly cognizant of their changing physical appearance and social behaviors, and have a strong desire to conform to their social group⁵⁹.

Depending on their developmental stage, adolescents may lack the cognitive ability to fully understand complex relationships, such as the connection between their current behavior and long-term consequences⁶². In qualitative research studies, adolescents report that consuming a healthy diet is not a primary concern during the teenage years, but rather is something they can worry about later in life⁶³. Adolescents' list several barriers to consumption of a healthier diet including: lack of time, feeling like healthier foods are inconvenient to prepare and consume, and preference for less

healthy options⁵⁹. Developmentally, adolescents-- particularly early adolescents-- have a predisposition to focus on the present rather than having a strong future-orientation⁶⁴, making it difficult for them to forgo the immediate benefits of a less healthy diet (highly palatable and convenient, energy-dense, nutrient poor foods) to select a healthier diet (rich in fruits, vegetables, whole grains, with low-fat protein sources), which will provide long-term health benefits. Taken together these developmental factors make the adolescent population an interesting, yet challenging, group with whom to work⁶³.

While long-term health consequences may provide minimal motivation for youth to consume a healthy diet, there are other influences, such as the social environment that significantly influence adolescents' dietary intake. Youth report that certain foods or food brands help them to build a desirable social image in front of their peers, and therefore they are motivated to consume those foods. Asian and Hispanic youth report eating junk food to be able to identify with their American friends and peers⁶⁵. In other studies youth have reported that 'healthy eating' is not something that they would like to promote as part of who they are, but rather it conflicts with the image they want to send⁶⁶. In one study, high caloric intake among young males was positively correlated with others' perception of their popularity⁶⁷. In another study adolescent girls associated "junk food" with 'friends' and 'having fun', whereas "healthy food" was associated with 'family meals' and 'home life'⁴¹. ***Promoting a healthy diet among adolescents can be challenging due to the developmental characteristics of that life stage, including assumptions that nutrition is only a concern later in life and because***

of adolescents' attempts to conform to social groups that seemingly promote unhealthy dietary intake. Adolescent obesity researchers and interventionists need to design and evaluate intervention strategies that address multiple drivers of obesity, including addressing social and developmental influences and factors that may promote obesogenic behaviors. Evidence-based strategies for adolescent obesity interventions in the social environment are lacking.

2.4 CONSEQUENCES OF ADOLESCENT OBESITY

Child and adolescent obesity has significant biological, physiological, and psychosocial health consequences. The disease burden associated with overweight and obesity is so great that for the first time in our country's history, the life expectancies of youth are projected to be shorter than that of their parents⁶⁸. On the biological and physiological side, pediatric overweight and obesity is associated with multiple co-morbid conditions⁶⁹ such as cardiovascular disease⁷⁰, type 2 diabetes⁷¹, asthma^{72,73}, fatty liver disease⁷⁴, and sleep apnea⁷⁵. On the psychosocial side, overweight and obese youth are subject to increased weight-related stigmatization, teasing/bullying and body image dissatisfaction^{76,77}. Some overweight and obese youth, particularly those seeking weight loss treatment may experience higher rates of other psychological conditions such as increased depression and low self esteem, but this should not be assumed to be true for all overweight and obese youth⁷⁸. Childhood and adolescent obesity often creates negative health impacts that continue over a lifetime, as overweight adolescents are at high risk of maintaining their elevated weight status into adulthood, and thus

having long-term health risks including obesity-related chronic diseases and premature mortality in adulthood^{79–82}.

At the population level, an important public health consideration associated with childhood and adolescent obesity is the economic impact. In the U.S., it was estimated that medical care costs associated with obesity were more than \$147 billion in 2008⁸³ and have continued to grow in recent years. Measuring the true costs associated with childhood obesity is difficult, as many of the largest costs of childhood obesity are incurred during adulthood. Several studies estimate that overweight and obese children and adolescents have increased medical care usage, and may have increased medical care costs as well^{84,85}. ***The physiological, psychosocial, and economic consequences of childhood and adolescent obesity are significant. Effective strategies for preventing and treating child and adolescent obesity are greatly needed.***

2.5 CAUSES OF ADOLESCENT OBESITY

At the most basic level, obesity is caused by an imbalance in energy intake and expenditure. Positive energy balance occurs when energy intake exceeds energy expenditure, and leads to weight gain. Despite the simplicity of the energy balance equation, there are multiple, complex factors that influence energy balance. Public health officials generally acknowledge that the rise in obesity in the U.S. occurred too rapidly to have individual level factors, such as genetics or biological processes, as the root cause⁸⁶; thus they have turned to examining other external factors as potential causes of this population-level shift in obesity⁸⁷. The role of the physical or built environment in influencing the weight status at the population level has been

acknowledged for nearly two decades⁸⁸, and continues to be an important area of research interest and proposed intervention⁹. Another area of importance that continues to emerge is the role of the social environment, and the influence of social relationships on energy balance-related behaviors⁸⁹.

2.5.1 The Nutrition Environment and Obesity.

The U.S. food system is driven primarily by economic factors (as opposed to health-related factors) and currently provides a large supply of inexpensive, highly palatable, high energy foods^{10,90}. When compared to national dietary guidance (measured via the Healthy Eating Index-2010), the food produced by the current system falls far from meeting recommendations, as the food systems produces less than half of the optimal amounts of total fruit, total vegetables, beans and greens, dairy, and whole grains⁹⁰. These factors have led experts to argue that our current food environment promotes excess caloric intake, and that the rise in obesity rates seen over the past few decades is a natural response to changes in the evolving food environment¹⁰.

On the local level, Sallis and Glanz⁹¹ describe the local food environment as having two components, both of which are related to health outcomes. The components are: the community nutrition environment referring to location, type, and number of food stores in an area; and the consumer nutrition environment referring to the cost and availability of food within the food stores in an area⁹¹. Low-income urban neighborhoods often have decreased access to supermarkets, and increased access to convenience stores and prepared food sources (i.e., fast food, carryout restaurants) compared to other neighborhoods^{92–95}. Smaller retail food outlets such as convenience

stores have fewer healthier items and higher food prices compared to supermarkets⁹⁶.

In low-income AA communities, higher food prices are associated with poorer diet quality and higher BMI among youth^{93–95,97,98}. Low access to healthier foods and high access to less healthy food have been associated with poor diet quality, obesity, and chronic disease in many studies^{13,99,100}, although the evidence remains mixed⁹⁷.

2.5.2 The Social Environment and Obesity.

While there has been a great deal of attention paid to the role of the physical environment and obesity^{101–104} over the past few decades, the social environment (i.e., adolescent's social networks; which to date has primarily focused on parents and friends) is a more recently emerging area of research has the potential to be highly influential on weight related behaviors^{18,89,105,106}. A study by Christakis and colleagues⁸⁹ used data from the Framingham Heart Study to examine how obesity spreads across a large social network. This study had health information, including BMI, from a social web of over 12,000 people at multiple time points. Because of the size of the study (nearly all residents of Framingham, MA participated), the study was able to link records of the participants to their parents, spouses, siblings, children, friends, and neighbors. Researchers found that over time obesity spread within the network similar to an infectious disease. Individuals were more likely to become obese if their social contacts became obese. Friends were the most influential social contact associated with increased likelihood of obesity followed by spouses and siblings⁸⁹. Studies in adolescent social networks have also found that the obesity status of social contacts is associated with increased likelihood of an individual becoming obese^{106–108}, though these findings

have received critique related to their statistical methods and should be interpreted cautiously¹⁰⁹.

Within adolescent's social networks it is well documented that parents play a critical role in the nutritional health and weight status of adolescents¹¹⁰. Peers and friends also play a significant role, particularly in the early adolescent age group (ages 10-14), as youth in this age group spend the majority of their waking hours in the presence of peers²⁵, and peer influence is the strongest among early adolescents⁶⁴. Among adolescents, parent and peer/friend relationships are the primary social relationships studied to date, with a gap in the literature being assessments of influences and interactions of other social relationships. Due to their complex, interpersonal nature, all social relationships can be challenging to assess and address¹¹¹.

Much of the initial work investigating the influence of social relationships on adolescent obesity examines the clustering of weight status and weight-related behaviors (eating and physical activity behaviors) among friend and peer groups^{67,112-114}. A recent review found that food intake, physical activity levels, and weight control behaviors all clustered in adolescent friendship groups¹¹². Weight status also clusters among friendship groups, with overweight youth being more likely to have overweight friends compared to normal weight youth¹⁸. Related to specific eating behaviors, one study found that adolescent's consumption of fruit, vegetables, whole grains, dairy and breakfast are related to their friends intakes of the same foods¹⁷. Another study found similarities among peers related to the youth pursuing an active sport, regularly exercising, and frequently eating at fast food restaurants, indicating that youth are more

likely to participate in these behaviors if their friends do^{113,114}. A limitation of these studies is, however, that many of them are cross sectional and cannot provide any causal linkages. In fact, it is difficult in these studies to assess whether the associations seen are due to the influence of the social relationships (causing individuals to become more similar over the course of the friendship), or due human tendency to select friends that are similar to ourselves¹¹⁵. Recently researchers have attempted to address this by using longitudinal study designs¹¹⁶. de la Haye and colleagues conducted a longitudinal assessment of Australian eighth graders using social network models, and found that adolescent's intakes of low-nutrient, energy-dense foods become or remained similar to the intakes of their best friends over the course of the school year¹¹⁶.

Salvy and colleagues¹⁸ discuss four possible mechanisms by which these peer influences operate: social facilitation (the presence of others increases the performance of a behavior), behavioral modeling (seeing similar others perform a specific behavior increases the performance of a behavior), impression management (attempts to control impressions others form of us), and social norms (perceptions of others' behavior or opinions influences the performance of a behavior). Peers and friends appear to have the strongest influence on eating and activity behaviors that occur in the social context where peers or friends are present, versus behaviors primarily conducted at home where peers and friends are not present¹²⁰.

de la Haye and associates¹¹⁶ also hypothesize potential processes that drive social influence, proposing two potential models. The first aligns with more traditional social modeling theories (such as theory of planned behavior and social learning

theory^{121,122}), where the observation of others' behaviors influences our beliefs and attitudes, which then guides our future actions. The second proposed model suggests that we have an ability to imitate others' behavior with little cognitive awareness (i.e., "mindless eating"). This is combined with Bem's self-perception theory that suggests one's beliefs about a behavior are shaped by their past engagement with that behavior¹²³. In summary, this second theory proposes that youth mindlessly mimic the eating behaviors of others, and shape their beliefs in such a way that they are aligned with the behaviors they have engaged in and endorsed in the past¹¹⁶. While these proposed models of influence are very interesting, moving forward, it will be important to gather evidence that clarifies and identifies the mechanisms of influence through which multiple social relationships influence adolescents' food intake, and how to best intervene upon these different mechanisms.

Future obesity prevention interventions should dually consider the social and physical environment, as both have well-researched effects on adolescents' obesity-related behaviors. Past studies have used cross-sectional and laboratory-based methods to assess the influence of parents and friends, with little attention given to other social relationships, or to developing strategies to intervene in both social and physical environments. Interventions that are able to intervene on multiple levels in both the social and physical environment are ideal because the majority of youth's social interactions take place in the same physical environment (i.e., the home, school, or neighborhood)¹¹⁶, making it difficult to separate one from the other. ***Coordinated strategies to intervene in the social and physical environment are needed, this thesis***

will add to the literature by examining social roles and interactions that low-income, urban, African American youth have with their parents, friends, and other social contacts to create suggested recommendations for intervening in the social environment.

2.6 CONCEPTUAL FRAMEWORK AND THEORETICAL BASIS FOR THIS RESEARCH

The conceptual framework guiding this study was adapted from a model created by Story and colleagues¹⁰⁵, that combines Social Ecological Theory (SET)¹²⁴ with Social Cognitive Theory¹²⁵ and others, to identify factors influencing the eating and weight-related behaviors of adolescents. The conceptual framework for this study (Figure 1) adapts Story's model by emphasizing the importance of the social environment and its interaction with the physical environment.

The framework uses the overarching themes of SET to demonstrate how the social environment is influenced by, and influences other components of the system. SET posits that multiple levels of influence (microsystem, mesosystem, exosystem, and macrosystem) interact with each other to impact the behavior of an individual within the context of the broader environment¹²⁴. SET describes influences on human behavior that span from the proximal microsystem context (individuals and their direct personal contacts) to the distal macrosystem context (policy, and food systems). In addition to using SET to provide an overarching framework, this model also uses components of several additional behavioral theories to address the influence of social relationships on eating behaviors, theories included here are: social learning theory¹²², social networks/social support theories¹²⁶, and social norms theories^{121,127,128}.

2.6.1 Social Learning Theory (Social modeling/behavioral observation)

Social Learning Theory, (SLT) is a behavioral theory developed by Albert Bandura¹²². SLT posits that one mechanism by which humans learn is through social or behavioral modeling, where new behaviors are learned/adopted through observing similar others perform a behavior and the results (or consequences) that occur in response to that behavior¹²². Social learning contains four components: attention (observing the behavior), retention (remembering characteristics of the behavior), reproduction (being able to re-create the behavior) and motivation (the decision to perform or abstain from the behavior). Similar to SET, SLT recognizes that behaviors so do not occur in a vacuum, but rather personal, environmental, and behavioral factors interact and mutually influence behavior¹²².

Social modeling in nutrition and eating behaviors is so pervasive that it can occur within the context of a single meal, during a few interactions, or over a lifetime. In a single meal setting, social modeling occurs when we use others' eating behavior to guide how much we should eat, meaning that we observe the actions of others and match our consumption patterns during that eating bout to the patterns of those around us. A recent non-systematic review of 69 studies on social modeling found that 64 studies found a positive relationship in favor of social modeling, despite wide differences in participant demographics, foods offered, and social context¹⁹. Social modeling has the strongest effects on amount consumed, but there is also some evidence showing that it can impact food selection as well¹⁹.

Another primary method through which social modeling is seen in nutrition-related behavior is demonstrated on a longer time-frame, by parents serving as role models of eating and activity behaviors for their children. Examples of how parents can role model healthy behaviors include consuming healthy food, and using healthy food preparation methods for family meals^{129,130}. Several studies have shown that parent's role modeling of healthy eating behaviors (often fruit and vegetable intake) are related to the dietary intakes and behaviors of their children^{131–135}. ***The literature shows that social modeling and observational learning have the potential to influence others' dietary intake. Training and encouraging social contacts to promote healthier behaviors through modeling is one potential strategy for intervening in the social environment.***

2.6.2 Social Norms

Social norms are implicit rules that are commonly understood by a group of people that guide behaviors or actions of group members^{20,127}. There are two types of norms commonly referenced, descriptive norms and injunctive (or subjective) norms. Descriptive norms are norms relating to what is commonly done by others, where as injunctive or subjective norms refer to other's perceived approval or disapproval of certain behaviors^{15,127}. Norms are described by the Theories of Reasoned Action and Planned Behavior^{121,128} as one of the main drivers of behavioral intentions, which in turn drive behavior^{121,128,136}. Researchers hypothesize that individuals are influenced by norms because conforming to social norms can increase group affiliation and provide

guidance for ways of eating that are perceived to be the ‘correct’ way to eat in any given social situation²⁰.

Studies have shown connections between social norms and nutrition and diet-related behavior. For example, social norms influence intakes of fruit and vegetables, sugar sweetened beverages, fast food, home-cooked dinner preparation, snacks and healthy lunch options^{15,20,137–140}. In general, studies found that descriptive norms were more influential than injunctive norms^{20,137,140}; however, mixed results were reported regarding whether parental norms or peer norms were more influential^{15,137,139,140}.

Social norms should be considered when intervening in the social environment as they reflect the influence of others’ opinions and actions, and potentially influence one’s own behaviors. Having social contacts generate an environment where healthier eating and regular physical activity are perceived as normative behavior may be an appropriate social environment intervention strategy.

2.6.3 Social Support Theories

Social network is a collective term used to describe the ‘web’ of social relationships tied to an individual¹²⁶. One beneficial aspect of social networks is that they can provide social support for the individual¹²⁶. Social support is a psychosocial construct built in several behavioral theories that is thought to be associated with dietary intake^{126,141,142}. Social support can be described as support or assistance provided through interpersonal relationships¹²⁶. Various types of social support exist including, emotional support (caring, empathy, love), instrumental support (tangible aid), informational support (advice, suggestions, information), and appraisal support

(feedback)^{126,143}. Interpersonal relationships that provide social support often provide multiple types of social support simultaneously¹²⁶. Diet-specific social support involves the application of these support structures to the promotion of healthy eating.

Researchers hypothesize that the mechanisms through which social support promotes healthy eating include: providing encouragement for healthy lifestyle practices via interpersonal exchanges (i.e., providing praise for healthy eating behaviors); providing access to helpful new information (i.e., providing low-calorie recipes); and providing increased support in stressful situations that threaten maintenance of healthier behaviors¹²⁶ (i.e., providing assistance to avoid overeating at a social event or party).

Adult studies have found beneficial relationships between social support and diet-related health indicators such as fruit and vegetable intake¹⁴¹, weight management¹⁴⁴, and physical activity¹⁴⁵; however the literature on social support and healthy eating in adolescents is lacking and inconsistent¹⁴². Some social support studies examine familial or parental social support^{146–149}, a few additional studies assess support from both parents and peers^{150–154}, and to our knowledge, no studies examine social support from relationships other than family or peers. Select studies found positive relationships between youth diet and parents' support for healthy eating^{146,148,153}, but the results are not consistent across all analyses^{150,151,154}. These mixed results are likely due to the wide variety of measures used to assess these relationships.

Among the studies that examine peer support for healthy eating, one study found a significant relationship with fat and fiber intakes, but the direction of these relationships was unexpected¹⁵¹. One study found that peer support increased fruit and

vegetable intake significantly among boys but not girls; the study authors hypothesized that this was because the boys may have peers with similar levels of interest in healthy eating, but did not speculate why the girls did not experience a similar pattern¹⁵².

Another study found no relationship between peer influence and fruit and vegetable intake¹⁵³, but the ability to measure the social support construct appropriately was questioned by the research team. To date, only one study has examined the relationship between dietary intake and social support for *healthy* and *unhealthy* eating as separate constructs. This study was conducted among middle and high income adolescents in Ireland, and found that higher peer support for unhealthy eating was associated with unhealthy food intake¹⁵⁰. No studies have examined the relationships between social support for both unhealthy and healthy eating behaviors and dietary intake among low-income, urban, African American adolescents. ***The research on social support and dietary intake among adolescents is mixed. This may be due to variation in the measures used to assess social support, and the need for future measures to examine multiple components of the social support construct. Additional research is needed to strengthen these measures and to fully understand these relationships. This thesis adds to the literature by examining the types of social support (for healthy and unhealthy eating) that friends and parents of low-income, urban, African American adolescents provide, and how this support influences the adolescent's diet quality.***

2.6.4 Social Facilitation and Impression Management

Social facilitation, which refers to individuals modifying their eating behaviors (generally eating more) when they are in group settings¹⁵⁵, and impression

management, which refers to an individual changing their eating behavior to generate or maintain a particular impression that other's have of them¹⁵⁵ are additional mechanisms through which social relationships may influence eating behaviors.

Basic eating studies provide some example evidence of how social facilitation and impression management influence youth eating behavior. Laboratory studies have shown that youth consume more snack food during an eating bout when their friends are present compared to when they are eating with unknown peers¹¹⁷, providing evidence of social facilitation of eating by friends. One study found that caloric intake increased significantly in the presence of friends, and that this result was even more profound among overweight friend groups, with overweight friend groups consuming more food than normal weight groups of friends and overweight youth that ate with normal weight friends¹¹⁷.

Attempts at impression management can also be seen in basic eating studies. For example, in another study youth consumed healthier snack options, even when less healthy snacks were available, when they were exposed to unknown peers consuming healthy snacks¹¹⁸. Reduced consumption or consumption of healthier food choices in the presence of unknowns peers, may be due to impression management, where youth try to avoid negative stereotypes associated with excess consumption among peers they are unfamiliar with¹⁵⁵.

When exploring the results of these studies together, we see friends may serve a social facilitation role, acting as 'permission givers' for extra or unhealthy consumption, while unknown peers, create a tendency for impression management strategies to be

used by youth, and therefore tend to cause a reduction in intake among overweight youth^{117,119}. While these lab based studies provide interesting insight about social influences on eating, the underlying mechanisms through which they operate is still unknown.

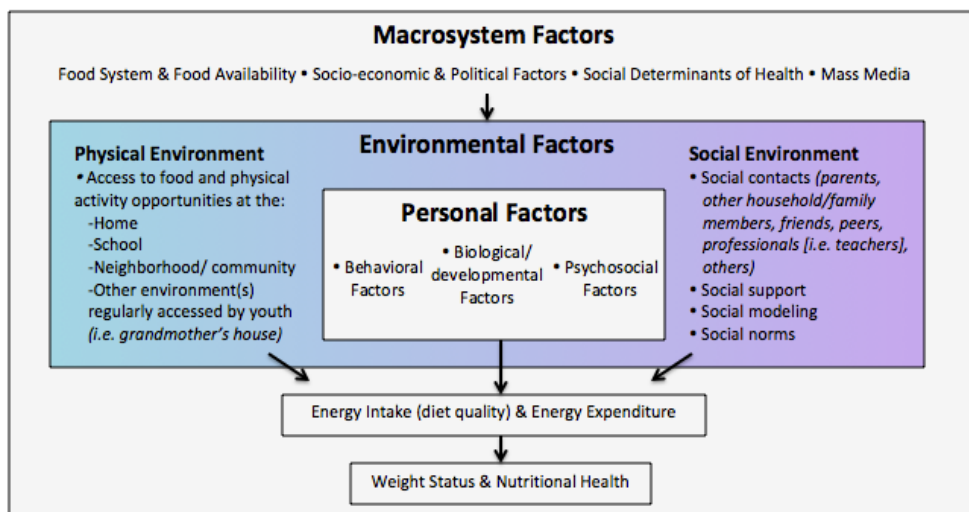


Figure 2.1: Conceptual Framework of Factors Influencing Adolescent Weight Status

2.7 OBESITY PREVENTION INTERVENTIONS FOR CHILDREN

Obesity rates in the U.S. and in other select developed nations have plateaued and started to decrease slightly^{2,3}. Despite these encouraging findings, many consider the progress made to date to be slow, given the global spotlight placed on developing solutions to the obesity ‘epidemic’^{34,156}. Initial obesity interventions focused primarily on individual behaviors and generated limited success⁸. In more recent years, with the ever-growing evidence base on obesity interventions, there have been shifts seen in what obesity and public health experts consider important for future obesity intervention efforts. One of these shifts can be seen in movement toward multi-level,

multi-component interventions that address several factors of the social ecological model including the individual, interpersonal, community, and policy level¹⁵⁷. Another shift is seen in developing interventions to prevent obesity, rather than treating it, under the presumption that it is easier and more beneficial for health to prevent weight gain, than to create weight loss^{158,159}.

Several recent reviews and meta analyses provide insight on the current state of the obesity prevention intervention literature. A Cochrane Review¹⁵⁹ on Obesity Prevention Interventions for pediatric populations included 59 studies. The results of the meta-analysis found evidence that obesity-prevention interventions were able to show small beneficial effects on BMI. These results were limited though, as the authors were unable to identify common intervention components that aided in producing these encouraging intervention effects. In addition, the strength of the evidence was mainly in interventions for youth ages 6-12 years old, with more limited findings for younger children and adolescents. The authors stated that additional research is needed in young children and adolescents, with longer duration, larger trials¹⁵⁹.

A review of community-based obesity prevention interventions by Bleich and colleagues¹⁵⁸ adds to the finding of the Cochrane Review by analyzing the results of 9 community-based trials, in which 4 of the studies finding desirable changes in BMI. This review concluded that there is moderate evidence to support obesity prevention in programs that include both diet and physical activity intervention components that are conducted in community and include a school-based component¹⁵⁸.

In the 2011 Lancet series on obesity, Gortmaker et al¹⁵⁷ synthesized the literature to assess obesity intervention strategies for 3 factors: the strength of evidence supporting the strategy; the hypothesized impact of the strategy (measured in disability-adjusted life years); and the cost effectiveness of the strategy. Regarding pediatric obesity interventions, several of the interventions recommended by Gortmaker and colleagues include multi-faceted, school-based interventions that address nutrition and physical activity behaviors¹⁵⁷. The 2015 Lancet series on obesity re-emphasized the call for multi-component interventions, and encouraged additional strategies at the policy and food system levels to create food environments that encourage healthy consumption habits⁹. ***Multiple reviews of the literature on obesity prevention interventions indicate that multi-level interventions (many of which include the school environment) show the most promising impact on preventing obesity.***

The Global Obesity Prevention Center at Johns Hopkins (GOPC)¹⁶⁰ is a research center funded by the Eunice Kennedy Shriver National Institute of Child Health and Human Development and the Office of Behavioral and Social Sciences Research. The GOPC focuses on taking a systems approach to addressing obesity. Most basically, taking a systems-approach means that the complex interaction between multiple causes of obesity (policy, economics, food environment, social influences, behavior, physiology, etc.) are considered when designing, modeling, and conducting obesity prevention interventions. The GOPC is driving obesity research forward and expanding systems-level approaches to public health by creating and simulating the food environment in Baltimore, and other locations; bringing researchers and policy makers together to

dialogue about change; designing and conducting interventions with multiple levels of impact; and managing a small grants program that supports innovative pilot projects that incorporate systems science modeling.

The B'More Healthy Communities for Kids intervention is one of the main projects within the GOPC, and puts the principles of the GOPC into practice. BHCK is a large multi-level, multi-component trial designed to increase access to, demand for, and consumption of healthier foods among African American adolescents (ages 10-14) in Baltimore City²⁸. The BHCK study works to prevent obesity by intervening at the policy, food wholesaler, small food retailer, youth-leader, family, and individual child levels. This thesis is a sub-study of the B'More Healthy Communities for Kids (BHCK) trial, focusing on different aspects of the social environment, and includes the development of social environment intervention strategies, specifically using youth-leaders, within the larger context of the BHCK trial.

2.8 YOUTH-LED NUTRITION, DIET AND WEIGHT-RELATED INTERVENTIONS

Given the evidence that supports the need for social environment intervention strategies within multi-level interventions, researchers have a growing interest in designing effective interventions to address the social environment. However it is recognized that that modifying the social environment by outside parties (such as researchers) may be difficult¹⁵⁵. Other health disciplines have had success by embracing the strong influence of friends, peers, and social relationships on adolescent behavior through incorporating youth into the intervention team as leaders to champion change in targeted health behaviors. One challenge of assessing the youth-led or peer-led

health intervention literature is the lack of consistency in terminology used to describe the role. For example related to the *individual in the role*, studies have referred to: peers, youth, volunteers, community health workers, etc. Studies also use a variety of terms to describe the *functions of these individuals*, such as: advisors, leaders, educators, counselors, facilitators, helpers, interveners, navigators, etc.¹⁶¹. It is important to note that in the context of this thesis, interventions where youth are involved in program development/ delivery will be referred to as “youth-led.” We have chosen this term intentionally. We use the ‘youth’ component in a way that is consistent with the definition of ‘peers’ in the literature (peers are those who share key characteristics, circumstances or experiences with the target group; generally have less training than professionals; and generally work using a standard protocol, guidelines, or manuals, rather than providing support as part of a naturally occurring social network)¹⁶¹. Using the term ‘youth’ also places an emphasis on the age-similarity with the target population. Peer-led interventions can be conducted with individuals of any age (including between youth and adults), therefore, in this research ‘youth’ provides a more accurate description¹⁶². The ‘leader’ component was selected to be inclusive of the many functions and roles that youth can play (such as providing education, support, counseling, etc.). For consistency, we will use the term ‘youth-leader’ throughout this thesis, it should be noted, however, that the literature cited here uses multiple terms interchangeably.

Youth-led models are thought to be beneficial because they can increase the engagement of both youth-leaders and youth participants in the intervention¹⁶³. The

results of youth-led interventions tend to be equivalent, or superior to adult-led interventions¹⁶⁴. Youth-led models have been successfully implemented in many areas such as HIV/AIDS prevention, asthma, physical activity, and eating disorders^{165–169}. Youth-led interventions in adolescent nutrition and obesity prevention are an important, yet understudied area of research.

To date, there have been a limited number of youth-led child and adolescent nutrition and obesity prevention programs in the literature, and all but two of these studies have been implemented in the school setting. These studies have varied widely in duration. About one-third of the studies are short duration (often pilot) interventions lasting from 5 to 12 weeks^{170–174}, one-third are slightly longer interventions lasting from 6 to 12 months^{175–180} and one-third are of long duration, lasting longer than 1 year^{181–183}. Approximately one-third of the studies used same-aged youth-leaders^{174,181–183} (where the youth-leaders and youth participants are the same age), with two-thirds of the studies using cross-age youth-leaders^{175–180,184}, meaning that the youth-leaders were slightly older than the youth receiving the intervention (i.e., college students paired with high school students, or high schools students paired with middle school students). There is significant value to using cross-age youth leaders as they are more developmentally ready to handle the complex role of serving as a youth-leader, yet are still able to develop strong relational connections with younger youth, and provide guidance and support similar to that of an older sibling¹⁶².

All of the youth-led studies in this literature review incorporated intervention components on dietary behaviors, and some had additional physical-activity

components. Despite the common topic area, the delivery of the intervention components varied. In many of the interventions, youth-leaders were given the opportunity to create 1-on-1 relationships with those youth receiving the intervention^{172,173,175,177–180}. In these studies, the youth-leader often worked with the target child on nutrition activities/games and served as a ‘buddy’ for physical activity^{172,173,175,180,185}. In other programs youth-leaders promoted nutrition messages by promoting and encouraging healthy choices in school cafeterias^{170,174,181,183} and community settings¹⁷⁶. These interventions also frequently involve youth in creating social marketing materials to promote healthy choices^{181,183}. In other studies, youth-leaders teach or aid in teaching health education sessions/curriculums to larger groups of target youth, often in the classroom setting^{171,182,184}.

The results of these studies are promising and included increased sales of healthier options in school cafeterias^{174,181,186,187}, decreased sugar sweetened beverage consumption in youth-leaders¹⁷⁰ and in youth^{171,184,188}, improvements in psychosocial outcomes (knowledge, attitudes, self-efficacy, and perceived social support)^{172–174,180,182,189}, decreased intake of snacks and desserts¹⁷⁵ and improvements in anthropometric measures^{173,175,177–180}. Table 2.1 contains a summary of youth-led intervention studies.

Table 2.1: Summary of Nutrition and Weight-Related Youth-leader Interventions

Authors (Study Name)	Participants	Youth-leaders	Study Design & Duration	Intervention Strategy	Youth-leader Intervention	Youth- participant Results	Youth-leader Measures	Youth-leader Results
Black et al, 2010 (Challenge!)	Urban African American middle school students (n=151) and comparison youth (n=84)	College students/recent college graduate (n=21)	RCT at the individual level Approximately 10 months	12 nutrition and physical activity sessions using motivational interviewing	1-on-1 mentoring provided by youth-leaders	↓ snack and dessert intake at post-intervention and 12 month follow-up, ↓BMI at 12 month follow-up in the intervention group	Qualitative interviews on perceptions of the intervention	Key themes: the importance of a strong mentor/mentee relationship, the impact of the intervention on youth-leaders own health behaviors & recommendations for future programs
Bogart et al, 2011 (SNaX Pilot)	7 th grade students in 1 intervention school (n=425). 1 school served as a control by providing cafeteria but not individual level data	Self-selected 7 th grade students in intervention schools (n=140)	Quasi-experimental, non-random 5 weeks	Modifications of the school environment, promotion of cafeteria foods, youth-led education	Each week a new group of youth-leaders was recruited to give out bookmarks and taste tests during lunch	↑# in healthier cafeteria options served	Youth-leaders were compared to other youth-participants on measures of cafeteria attitudes and SSB consumption	↑in youth-leader cafeteria attitudes and ↓ in youth-leader SSB consumption compared to non-youth-leader participants
Bogart et al, 2014 (SNaX)	7 th grade students in 5 intervention (n=1,515) and 5 comparison (n=1,524) schools in Los Angeles	Self-selected 7 th grade students in intervention schools (n=454)	RCT at the school level 5 weeks	Modifications of the school environment, multi-media, promotion of cafeteria foods, youth-led education	Each week a new group of youth-leaders was recruited to give out bookmarks and taste tests during lunch	↑ # of lunches and servings of fruit provided at lunch meals, ↓# of snacks sold at lunch	Included in participant data collection & reporting	N/A
Cawley et al, 2011	Inner city minority high school students in 6 intervention (n=511) and 5 comparison (n=460) schools in New York	Recent college graduates, racial/ethnically matched to participating schools (n=6)	Quasi-experimental, non-random 1 semester	1 youth-leader placed at each intervention school led nutrition classes, held lunch-time sessions, and after-school clubs	Youth-leaders were responsible for all intervention components	↓ soda intake among girls	None reported	N/A

Authors (Study Name)	Participants	Youth-leaders	Study Design & Duration	Intervention Strategy	Youth-leader Intervention	Youth- participant Results	Youth-leader Measures	Youth-leader Results
Lo et al, 2008 (FUEL)	9 th grade students in urban and suburban Canada (intervention= 57, comparison=48)	9 th grade students (n=6), undergraduate students (n=5) and recent college graduates (n=2)	Quasi-experimental non-random 6 weeks	6 weekly, 45-minute classes on SSB consumption taught by youth-leaders (intervention) or through a self-study module (comparison)	Youth-leaders assisted in intervention delivery in intervention classrooms	↓ in SSB intake of youth who received the youth-lead intervention at 3 months compared to youth that received traditional intervention	None reported	N/A
French et al, 2004; Hamdan et al, 2005 (TACOS)	Students in 20 suburban Minnesota high schools (n=10 intervention schools, 10 comparison schools)	Within each school, there highly involved (n=54) and minimally involved (n=343) youth-leaders	RCT at the school level 2 years	Increased lower fat offerings in cafeterias and youth-led promotions of lower-fat foods	Youth-leaders promoted lower fat foods in cafeteria through taste tests and media campaigns	↑ # of healthier foods sold in intervention versus comparison school cafeterias	Highly and minimally involved youth-leaders were assessed on healthy eating behaviors and psychosocial factors related to healthy eating	Highly involved student reported ↑ healthy eating behaviors and attitudes toward lower-fat foods compared to minimally involved youth
Lytle et al, 2004; Story et al, 2002; Birbaum et al, 2002 (TEENS)	Students in 16 middle schools in Minnesota (n=8 intervention schools, n=8 comparison schools)	Seventh grade students elected by their peers (n=226)	RCT at the school level 2 years	Interventions to improve cafeteria offerings, a 10-session classroom-based nutrition education program, and parent newsletters	Youth-leaders assisted classroom teachers in intervention delivery (led small group discussions, prepared taste tests)	Slight ↑ in lower-fat food intake in intervention school youth	All participants were assessed on dietary intake measures, and psychosocial factors related to healthy eating	Youth-leaders had biggest ↑ in intakes of fruit, vegetables, lower-fat foods
Sieg-Riz, 2011; DeBarr, 2009 (HEALTHY)	Students in 42 middle schools across the US (n=21 intervention schools, n=21 comparison schools)	Middle school students (n= NR)	RCT at the school level 5 school semesters	School nutrition and physical activity environment changes, social marketing campaign	Youth-leaders helped develop social marketing materials and made health-related morning announcements	Slight ↑ in fruit and water intakes in intervention school youth	None reported	N/A
Gittelsohn, 2013; Gittelsohn, 2015 (BHEZ)	Urban African American youth in Baltimore, MD (intervention=89, comparison=63)	African American youth ages 13-18 (n=13)	RCT at the neighborhood level 7 months	Food environment intervention in corner stores and recreation centers	Youth-leaders conducted taste tests/food promotions in recreation centers	↓ in BMI of overweight and obese girls, and girls with high intervention exposure	None reported	N/A

Authors (Study Name)	Participants	Youth-leaders	Study Design & Duration	Intervention Strategy	Youth-leader Intervention	Youth- participant Results	Youth-leader Measures	Youth-leader Results
Smith, 2011	Rural Appalachian elementary school students in Ohio (intervention=35, comparison=37)	Rural Appalachian high school students in Ohio (n=13)	RCT at the individual level 10 weeks	10 week, 1-on-1 delivery of a nutrition curriculum versus an attention control group	1-on-1 delivery of weekly nutrition curriculum	Intervention children had ↓ in BMI percentile and ↑ in psychosocial factors from pre-to-post intervention	None reported	N/A
Smith et al, 2013	Rural Appalachian elementary school students in Ohio (intervention=45, comparison=55)	Rural Appalachian high school students in Ohio (n=32)	RCT at the individual level 8 weeks	8 week, 1-on-1 delivery of a nutrition curriculum taught by youth-leaders versus a group intervention delivered by teachers	1-on-1 delivery of weekly nutrition curriculum	↑ in physical activity and behavioral intentions in youth-led groups	None reported	N/A
Smith et al, 2015 (Sodabriety)	Rural Appalachian high school students (n=186)	Rural Appalachian high school students (n=24)	Quasi-experimental, pre-post design 30 days	Youth-designed social marketing campaign to promote reductions in SSB consumption	Design and promotion of a social marketing campaign	↓ in daily SSB servings and increased water intake from pre-to-post intervention	None reported	N/A
Eskicioglu, 2010	First Nation elementary school students in Canada (intervention=51, comparison=100)	First Nations middle and high school students (n=NR)	Quasi-experimental, non random 5 months	5 month culturally-tailored diabetes prevention curriculum delivered weekly, 1.5 hour sessions lead by youth-leaders	Delivery of curriculum in small groups (ratio of 3-4 youth to 1 youth-leader), and group physical activity sessions	↓ zBMI, waist circumference, ↑ in knowledge and self-efficacy in intervention versus comparison group	None reported	N/A

Authors (Study Name)	Participants	Youth-leaders	Study Design & Duration	Intervention Strategy	Youth-leader Intervention	Youth- participant Results	Youth-leader Measures	Youth-leader Results
Stock et al, 2007 (Healthy Buddies, pilot)	Canadian students in grades k-3 (intervention=100, comparison=61)	Canadian students in grades 4-7 (intervention=128, comparison=71)	Quasi-experimental, non-random 21 weeks, 2-3 hours/week	Older “buddies” received a 45-minute lesson on healthy eating, body image or physical activity, then delivered a similar 30 minute session to younger “buddies,” plus paired physical activity sessions	1-on-1 delivery of a 30 minute educational session, and paired physical activity sessions	Younger buddies: ↑ in knowledge, and attitudes compared to controls	All participants were assessed on psychosocial factors, physical fitness, anthropometry, and body satisfaction	Older buddies: ↑ in knowledge, attitudes and health behaviors, and improvements in weight and BMI compared to controls
Campbell et al, 2012 (Healthy Buddies, British Columbia)	Canadian students in grades k-3 (intervention=364, comparison=193)	Canadian students in grades 4-7 (intervention=509, comparison=214)	Quasi-experimental, non-random 21 weeks, 2-3 hours/week	See Stock et al.	See Stock et al.	Younger buddies: ↑ in knowledge, and health behavior scores compared to controls	All participants were assessed on psychosocial factors, anthropometry, and eating disorder symptomology	Older buddies: ↑ in knowledge, attitudes compared to controls
Ronsley et al, 2013 (Healthy Buddies, Aboriginal)	Aboriginal youth in grades k-3	Aboriginal youth in grades	Quasi-experimental, non-random 10 months	See Stock et al.	See Stock et al.	↓ waist circumference, zBMI compared to controls	All participants were assessed on psychosocial factors, physical fitness, anthropometry, and dietary intake	N/A
Santos et al, 2014 (Healthy Buddies, Manitoba)	Canadian students in ages 6-8 years (intervention=158, comparison=182)	Canadian students in ages 9-12 years (intervention=156, comparison=151)	RCT at the school level 21 weeks	See Stock et al.	See Stock et al.	↓ waist circumference, ↑ in self-efficacy, knowledge, and dietary intake compared to controls	All participants were assessed on psychosocial factors, physical fitness, anthropometry, and dietary intake	↓ in daily step counts compared to controls

Abbreviations: RCT= randomized controlled trial, N/A = not applicable, SSB= sugar sweetened beverage, zBMI = Body Mass Index z-score, NR = not reported

These initial successes indicate that nutrition-related health improvements can be obtained using youth-leader programs and further research is needed to truly understand the utility of incorporating youth-leaders in obesity-prevention programs. An important place to begin expanding this literature is by looking at the impact of the program on the youth-leaders themselves. Evidence from the youth-leader literature shows potential for youth-leaders to receive the largest impact of the intervention, most likely because they receive the highest dose of the intervention¹⁹⁰. However, among the nutrition-related youth-leader literature many studies fail to report any outcomes related the youth-leaders^{171–173,176,184}. Studies that use same-age youth-leaders tend to assess the youth-leaders along with the general study population, but do not include additional data collection on the unique role of the youth-leaders^{177–179,183,191}. A limited number of studies conducted additional measures and analyses to understand the unique impact of the intervention on youth-leaders^{170,175,181,187,190,192}.

Another important aspect of youth-led interventions is the training of the youth-leaders. The youth leaders' level of training and readiness for intervention delivery will have a direct affect on how well they are able to implement the intervention. The published nutrition and obesity-related youth-led intervention literature varies widely in the amount of training and preparation that the youth-leaders receive. Several studies did not report having any formal training for the youth-leader role, but instead had regular group meetings with adult teachers or other group leaders^{174,177–180,183,187} often in the form of an after-school club or in-class session. Several studies report youth-leader training that lasts less than 1-2 days^{172,173,176,190}, with other studies reporting

trainings lasting 1-2 weeks^{170,171,184}. One study, the Challenge! intervention reported having a 40-hour training program with on-going training support meetings throughout the study. Much of the training in the Challenge! intervention was geared toward safety and independent intervention delivery, as this program was delivered in a 1-on-1 fashion in the participant's private homes, and therefore required high levels of youth-leader training^{175,192}. ***There is great promise in the use of youth-leaders in adolescent nutrition interventions, but currently there is a lack of understanding on how the interventions impact the youth-leaders themselves, and how to best train youth-leaders. This thesis will fill the gaps by developing, implementing and evaluating a youth-led intervention within the BHCK study.***

2.9 CHAPTER SUMMARY

There is a significant need for nutrition interventions in low-income, urban, minority adolescent populations considering their poor dietary intake and high prevalence of overweight and obesity. Promoting a healthy diet among adolescents can be challenging due to the physiological, developmental, and psychosocial changes associated with the adolescent life stage, yet, the health and economic consequences of obesity in this population are too great to not attempt to intervene. Effective strategies for preventing and treating child and adolescent obesity are greatly needed. Current research indicates that obesity interventions should dually consider the social and physical environment, as both have well-researched effects on adolescents' obesity-related behaviors. Reviews of the literature on obesity prevention interventions also indicate that multi-level interventions show the most promising impact on preventing

obesity. Drawing from the conceptual framework presented in this chapter, training youth-leaders to be supportive and positive role models for healthy eating behaviors, in the context of a larger environmental intervention (such as the BHCK intervention), could be one way to successfully intervene in this area.

CHAPTER 3: METHODS

This chapter provides an in-depth review of the methods used to conduct this thesis. The methods include quantitative and qualitative data collection and analysis, and the development and implementation of a youth-led intervention component nested within the BHCK study. In addition, this chapter will provide an overview of the BHCK parent study, describe the context of the study setting, and review important ethical considerations that were addressed in the data collection, analysis, and study implementation processes.

3.1 STUDY OVERVIEW

B'More Healthy Communities for Kids is a large, multi-level, systems-oriented child obesity prevention intervention, supported through an U54 grant to the Johns Hopkins Bloomberg School of Public Health to fund the Global Obesity Prevention Center at Johns Hopkins. The BHCK intervention is guided by social cognitive theory (SCT), social ecological theories, and systems theory^{122,124,125,193}. Combining these theories allows us to conceptualize a system in which individual psychosocial factors (e.g. knowledge, intentions and self-efficacy), social environment factors (e.g. social norms, social learning and social support), and physical environment factors (e.g. food availability, price) interact on multiple levels, using bi-directional feedback to shape individual and institutional behaviors. Because of the complex interactions within the systems that drive obesity in Baltimore, multiple, coordinated intervention components were created to intervene in a systematic and comprehensive way on the policy, food wholesale, retail food store, youth-leader and caregiver levels (Figure 3.1).

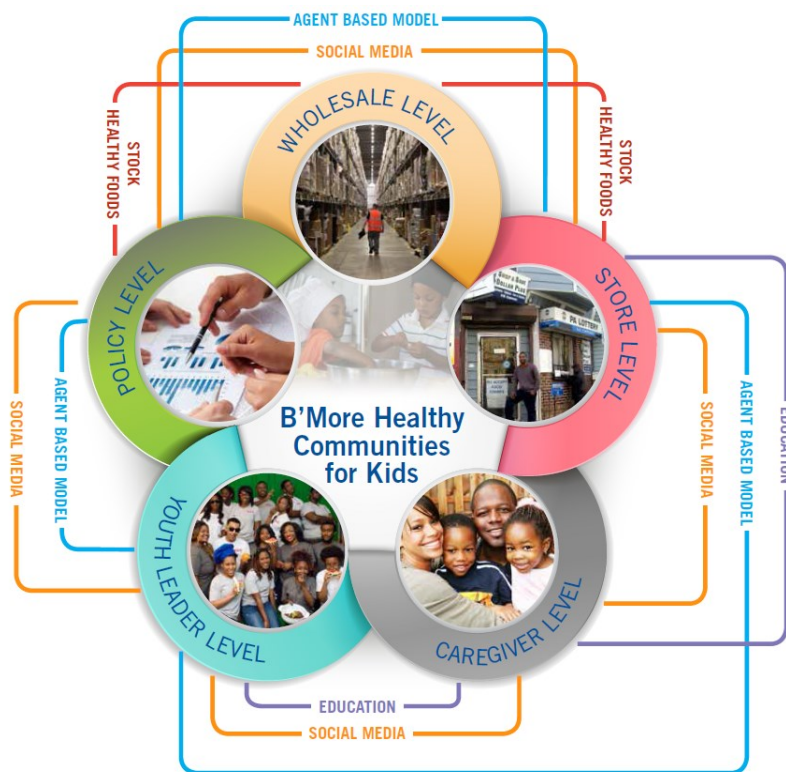


Figure 3.1: Intervention components for the BHCK study

On the **policy level**, BHCK created a working group of key stakeholders (including city government officials) to enhance support for and promote sustainability of the BHCK project. The policy working group also partners with policy makers to develop systems science simulations to aid in decision-making. On the **food wholesaler level**, BHCK works with the major food wholesalers in the city to increase stocking of healthier items and to provide pricing incentives, such as group purchasing discounts, to small food retailers. On **small retail food store level**, BHCK works with and provides training to store and restaurant owners to help them stock and sell healthier food and beverage items and use point of purchase promotions (such as interactive sessions in the store, posters, menu boards, shelf labels, etc.) to boost sales of healthier items. At the **youth-**

leader level, a cohort of Baltimore-based young people deliver interactive sessions on nutrition and healthy eating to younger youth at local recreation centers and small retail food outlets. Youth-leaders also promote healthy behaviors by generating social media content for Facebook and Instagram. On the **caregiver level**, a text-messaging and social media campaign delivers healthy messages to caregivers and families multiple times per week²⁸.

Due to the size of the intervention, the BHCK study was divided into phases, the study is currently in the fourth Phase (see Figure 3.2). Phase 1 included formative research, intervention development, and pilot testing. Phase 2 included recruitment and baseline data collection for Wave 1 participants. Phase 3 includes the Wave 1 intervention delivery. Phase 4 includes post-intervention data collection for Wave 1 participants. Phases 5-7 include the baseline data collection, intervention delivery, and post-intervention data collection for Wave 2 participants. Phase 8 includes the overall analysis and dissemination of study findings, however, select analysis and dissemination activities occurred in tandem with the other phases.

This thesis is nested within the larger BHCK study, specifically taking place in Phases 1-4. This thesis worked to develop, collect, and analyze the data described in Phases 1 and 2, and to develop, implement, and evaluate the youth-leader component of the intervention delivery described in Phases 3 and 4. The following sections of this chapter will elaborate on each component of this thesis.

3.2 TIMELINE

The timeline for this thesis along with the timeline for the BHCK parent study are found in Figure 3.2. The formative research data collection occurred in Phase 1 from May 2012 to August 2013. The recruitment and BHCK baseline data collection (Phase 2) occurred from August 2013 to July 2014. The development, implementation, and some evaluation components of the youth-leader intervention occurred from January 2014 to January 2015, with additional post-intervention data collection occurring from February to May 2015. Currently, the BHCK intervention is beginning Phases 4 and 5 (Wave 1 post-intervention data collection and Wave 2 baseline data collection). It is anticipated that both waves of the BHCK intervention will be completed by December 2016.

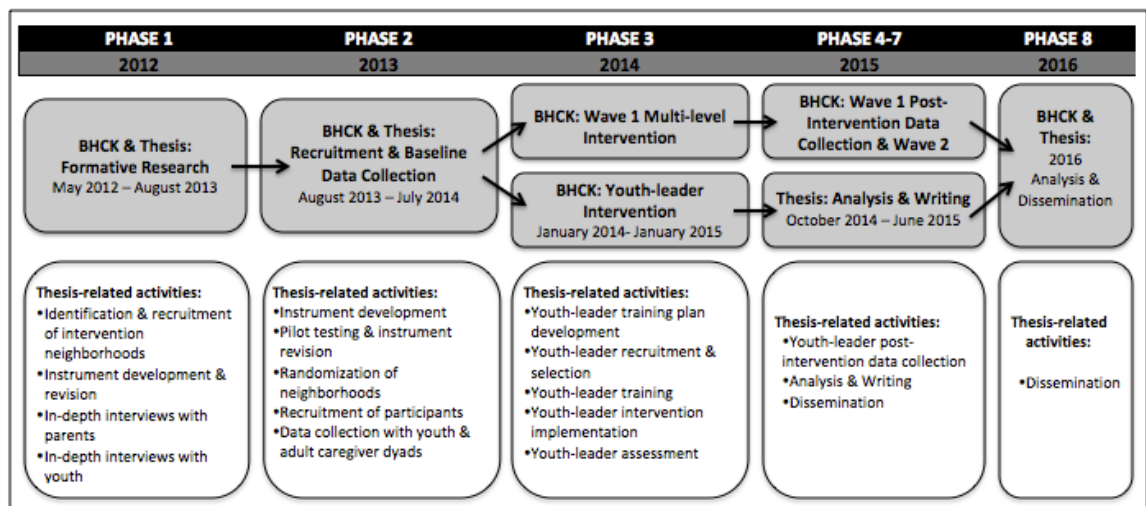


Figure 3.2: Timeline for the BHCK Study and for this Thesis

3.3 STUDY SETTING

This study was set in low-income neighborhoods of Baltimore City, Maryland. Baltimore is a mid-Atlantic city located on the Chesapeake Bay approximately 40 miles north of Washington D.C. According to the 2013 U.S. Census estimates, the City of

Baltimore has a population of over 620,000 people and is 63.3% black or African American, 31.6% white, 2.6% Asian, and less than two percent of each of the following: Native Hawaiian/Pacific Islander and two or more races. On average Baltimore City residents have a median household income of \$41,385 and 23.8% of households live below the federal poverty level¹⁹⁴. Baltimore City has a land area of approximately 80 square miles¹⁹⁴, and consists of many neighborhoods, with strong neighborhood identities. There is large variation in the characteristics of different Baltimore neighborhoods such as income levels, race and ethnicity demographics, food availability, and health variables. One glaring example of this is the difference in life expectancies of individuals born into different Baltimore neighborhoods. For example, in the Coldstream neighborhood in East Baltimore (which was part of the BHCK study) residents have an average life expectancy of 64 years and in the Roland Park neighborhood in Northeast Baltimore residents have an average life expectancy of 84 years. This creates a glaring twenty-year difference in average life expectancy of neighborhood residents, which is particularly startling because these neighborhoods are less than 5 miles apart¹⁹⁵.

The BHCK study has eligibility criteria that required the research team to focus on select neighborhoods within the city. Neighborhoods that were eligible for the BHCK study were required to be predominately African American (>50% African American), low-income (more than 20% of households falling below the Federal Poverty line), containing a Recreation Center (or other potential community gathering space that could be used in the intervention delivery), have a high density of small retail food

outlets (3-5 corner stores and carry-outs within .25 miles of the recreation center) and lack of larger retail food outlets (no grocery stores or supermarkets within .25 miles of the recreation center).

At the time of the inception of the BHCK study, a total of 38 neighborhood zones met the eligibility requirements. The first wave of the BHCK study successfully recruited 14 neighborhood zones to participate in the study. Because the neighborhood zones each have a recreation center at the core, in this thesis the neighborhoods will be referred to by the name of the corresponding recreation center, for clarity purposes. Recreation centers in Baltimore City were selected to be at the center of the neighborhood zones because most centers are associated with specific elementary or middle schools and offer snack and supper programs. The centers serve as the primary after-school program for Baltimore City children. The vast majority of children who attend these centers are African American, from low-income households, attend schools with high levels of free or reduced-cost lunch, and purchase foods from small stores and carry-outs surrounding the centers before and after school¹⁹⁶. The neighborhood zones include: Chick Webb, Greenmount, Collington Square, Madison Square, Coldstream, Ft. Worthington, John Eager Howard, Bentalou, Edgewood, Patapsco, C.C. Jackson, Samuel F.B. Morse, Lillian Jones, and Furley.

When looking at the neighborhood zones plotted on a map (Figure 3.3), it becomes evident that these neighborhoods are generally located in East and West Baltimore, with the exception of the Patapsco/Cherry Hill neighborhood zone, which is located in South Baltimore. Table 3.1 contains sociodemographic information about

each neighborhood zone, along with the averages for Baltimore City to serve as a comparison. This information is taken from the Baltimore City Neighborhood Health Profiles, which are published by the Baltimore City Health Department¹⁹⁵. The characteristics of these neighborhoods are similar; they include high rates of unemployment and poverty, and very low household income levels. Individuals in these neighborhoods have limited educational attainment, with most residents completing a high school diploma or less. Many, but not all, of the neighborhoods experience high rates of crime (Table 3.1 provides homicide rates as one measure of this, but other measures of crime show similar patterns¹⁹⁵). Life expectancies of individuals born into these neighborhood zones are similar to or shorter than the average for the City of Baltimore.

The food environment, combined with other factors such as low vehicle ownership, can make access to healthier foods difficult in neighborhoods such as these. Many of these neighborhoods are considered “food swamps” meaning that not only do they have limited access to healthier options, they also have high availability of less expensive, highly processed, energy dense foods and beverages¹⁹⁷ (as seen by the high corner store and carry-out densities in Table 3.1). Research conducted in Baltimore by Franco and colleagues^{198,199} shows clear disparities in healthy food availability (as measured by healthy food availability index scores that account for availability and price of selected food items). Significantly more predominately white and higher income neighborhoods in Baltimore were rated as having high healthy food availability when compared to low income and predominately African American neighborhoods. Even

Table 3.1: Characteristics of Neighborhoods Participating in Wave 1 of the BHCK Study

Neighborhood Zone/ Recreation Center Name	Neighborhood Location	% African American	Median Household Income	% Households earning <\$25,000/year	Unemployment Rate	% Families below the poverty line	% with HS diploma or less	Homicide rate	Carry-out Density	Corner Store Density	Grocery Store Proximity (minutes)	Life expectancy at birth (years)	Wave 1 Intervention status
Beantlou	Southwest Baltimore	76%	\$27,158	45%	20%	26%	70%	44.2	24.0	25.7	8	65.0	Comp
C.C. Jackson	Southern Park Heights	96%	\$27,635	47%	18%	26%	70%	43.7	7.5	6.0	8	66.7	Comp
Chick Webb	Perkins/ Middle East	87%	\$18,522	57%	18%	28%	66%	61.0	34.9	10.9	8.0	68.2	Int
Collington Square	Clifton- Berea	97%	\$24,696	51%	20%	18%	79%	61.8	13.2	17.2	10	64.9	Int
Coldstream	Midway/ Coldstream	96%	\$30,068	45%	21%	23%	74%	45.8	19.8	20.8	13	63.7	Int
Edgewood	Edmonson Village	97%	\$34,814	34%	12%	13%	65%	19.0	1.3	8.9	29	71.6	Comp
Ft. Worthington	Clifton- Berea	97%	\$24,696	51%	20%	18%	79%	61.8	13.2	17.2	10	64.9	Int
Furley	Cedonia/ Frankfort	79%	\$38,144	28%	11%	13%	61%	6.8	11.9	4.7	10	71.9	Comp
Greenmount	Midway/ Coldstream	96%	\$30,068	45%	21%	23%	74%	45.8	19.8	20.8	13	63.7	Int
John Eager Howard	Penn North/Reservoir Hill	91%	\$30,597	41%	19%	17%	57%	27.9	9.3	9.3	n/a	68.1	Int
Lillian Jones	Sandtown-Winchester	97%	\$22,277	56%	21%	31%	76%	45.3	14.2	19.6	6	65.3	Comp
Madison Square	Greenmount East	94%	\$20,708	57%	20%	38%	76%	39.9	10.8	28.1	11	65.9	Int
Patapsco	Cherry Hill	96%	\$19,183	61%	28%	45%	66%	35.4	7.3	6.1	32	67.8	Comp
Samuel F.B. Morse	Southwest Baltimore	76%	\$27,158	45%	20%	26%	70%	44.2	24.0	25.7	8	65	Comp
Baltimore City Ave.	n/a	64%	\$37,395	33%	11%	15%	53%	20.9	12.7	9.0	12.3	71.8	n/a

Abbreviations: HS= high school, Comp=comparison, Int=intervention, n/a= not applicable

when grocery stores are present, issues with equitable access to food persist, as supermarkets in predominately black neighborhoods had lower healthy food availability scores than supermarkets in white neighborhoods¹⁹⁸.

Taken together, this demographic, socioeconomic, and food environment information about the neighborhood zones involved in the BHCK intervention, sets the stage for this thesis research. Some of these variables, for example food store density and income levels, will inherently make it more difficult to address obesity in this population. However, these neighborhoods have the potential to benefit greatly from the intervention strategies.

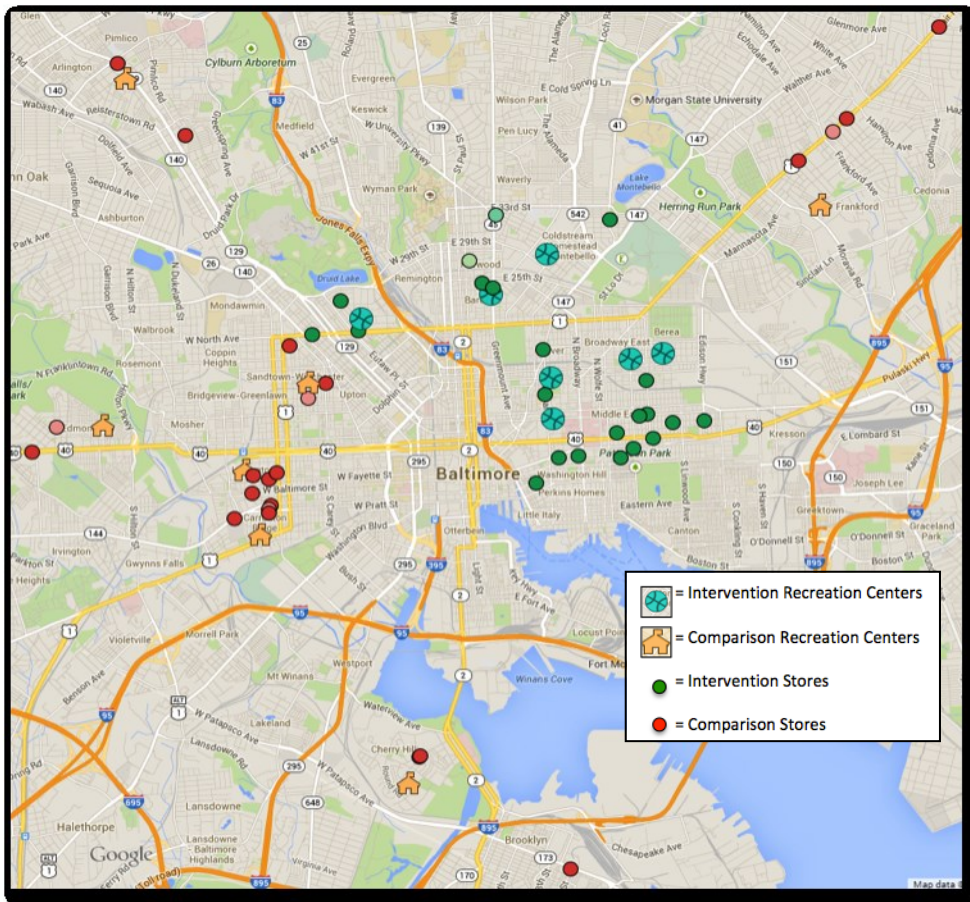


Figure 3.3: Map of Participating Wave 1 Recreation Centers and Stores

3.4 STUDY COLLABORATORS

The BHCK study has community and institution-based collaborators on every level of the intervention. Two specific partnerships were vital to the work completed as part of this thesis: the Baltimore City Recreation and Parks Department and New Lens.

The Baltimore City Recreation and Parks Department (BCRP) provided a significant amount of support for this project on the institutional level and the individual neighborhood recreation center level. Institutional level support from the BCRP leadership began with the project's inception, and has continued throughout the project at varying levels. This support included providing feedback on and approval for the implementation of the BHCK programming in recreation centers, providing screening and background checks for youth-leaders to be able to work with youth in the recreation centers, and encouraging recreation center staff to support the program. At the individual recreation centers, recreation center directors and program staff provided a significant amount of support by aiding in the recruitment of eligible youth/families to participate in the study, coordinating schedules and providing space in the recreation center for the intervention sessions, and reinforcing nutrition and healthy eating messages between intervention sessions. Not unlike other government institutions the support of BCRP was constrained by budget limitations and high rates of staff turnover, but in general, a supportive partnership was maintained consistently throughout the program, and is ongoing with another sub-study working with BCRP leadership to investigate the sustainability and institutionalization of youth-led nutrition interventions in BCRP programming.

New Lens is a “youth driven social justice organization that makes art and media to advocate for issues that impact young peoples lives”²⁰⁰. Based in West Baltimore’s Reservoir Hill neighborhood, New Lens has a long-standing partnership with the BHCK Principle Investigator that includes work on past projects. New Lens partnered with BHCK on multiple aspects of the project, beginning with a photovoice project that was a component of the formative research for BHCK²⁰¹. New Lens also played a key role in developing media for the BHCK intervention which included the production of a series of three videos used in the BHCK intervention, and a photo shoot of the youth-leaders from which the BHCK intervention posters were created using the youth-leaders as ‘spokespeople’ for healthy eating behaviors. The BHCK recreation center curriculum for the cooking component was designed in partnership with New Lens staff, and pilot-tested by youth staff from New Lens with support from the BHCK staff. Additional curriculum components for the beverages, snacks, and breakfast components of the intervention were reviewed and significantly revised by New Lens staff before implementation.

The BHCK and New Lens partnership was critical to the success of the youth-leader intervention component. The youth-leader training plan was designed in a collaborative process between the New Lens staff and the BHCK project team, with New Lens bringing expertise in youth-leadership skills training, team-building, and teaching group facilitation methods; and BHCK staff contributing expertise in nutrition and behavioral eating. A New Lens staff member was present and provided feedback on the majority of the interviews with youth-leader applicants, and selection of youth-leaders

was made by joint decisions between the New Lens staff member and BHCK team members. All of the youth-leader training sessions were jointly delivered by two New Lens staff members, and two BHCK staff members. New Lens staff also provided booster training sessions periodically throughout the intervention to re-energize youth-leaders and refresh skills.

3.5 DATA COLLECTION

The data collection for this thesis can be categorized into four phases. Phase 1 includes the design and collection of formative research data using in-depth interviews with youth (n=38) and parents (n=10). Phase 2 involves the development and collection of baseline survey data from youth for the BHCK intervention (n=297). The third Phase involves data collected as part of the development and implementation of the youth-leader component of the BHCK obesity prevention intervention, including baseline assessments, and the mid-point in-depth interviews. The fourth Phase involves collection of post-intervention assessments from the youth-leaders. Related to the youth-leader intervention, the data collection for this thesis focused on qualitative interviews and quantitative surveys with young people who were selected to be youth-leaders (n=16) and quantitative surveys from a group of comparison youth (n=10).

3.5.1 Phase 1 Data Collection (Formative Data Collection)

Broadly, the purpose of formative data collection is to help researchers identify specific health-related behaviors of concern and determinants of those behaviors²⁰². In addition, formative research aids in intervention development by obtaining detailed information about the target population and contexts in which interventions will occur.

Formative work allows researchers to obtain emic (or insider) perspectives on issues related to the health behavior or outcome of concern and identify assets or resources that the community has in dealing with the health issue of interest²⁰².

The formative research for the BHCK intervention was unique and added to the formative research previously done in Baltimore^{203,204} because there was a focus on identifying strategies to address issues on multiple levels of the food system. This included the interviews with youth and their parents described in this thesis and also interviews with policy makers, food wholesalers, and retail food storeowners, with the broad goal of identifying solutions to barriers at multiple levels of the food system that make accessing and consuming healthier foods difficult for youth and families in low-income Baltimore neighborhoods.

The components of formative research directly tied to this thesis research relate to the social environment and therefore focus on interviews conducted with parents and youth. Specifically, this investigation focused on collecting data related to the interactions that youth have with their social contacts around eating and physical activity behaviors and the roles that social contacts play in influencing eating behaviors. This information helped the BHCK study to develop intervention strategies targeting multiple social relationships (parents, youth, youth-leaders) through communication channels best suited to reach the target audiences, and is the focus of Chapter 5 of this thesis.

Formative Research Methods. The formative research methods used in this research include in-depth interviews with youth and with parents of youth. Youth and

parent interviews were conducted individually or in pairs. Paired youth interviews were conducted to facilitate the comfort and openness of the respondents. Six youth interviews were conducted in pairs. One paired caregiver interview was conducted because the caregivers were from the same household (husband and wife).

Development of In-depth Interview Guides. Separate qualitative instruments were developed for the in-depth interviews with youth and the parents. Because these in-depth interviews served as the basis of the formative work for the entire BHCK study, the interview guides were designed to be broad, using a variety of open-ended questions to address themes related to: (1) the current eating and activity related behaviors of the youth; and (2) the environmental, social, and household influences on eating behavior of the youth. This thesis focused on the questions related to the social relationships and social factors that influences youth's eating. The complete interview guides for youth and the caregivers can be found in Appendix A. Example questions from the youth interview include: Could you tell me more about how your family eats and buys food? How do your friends' choices for food affect the foods you eat? Example questions for parents include: Does your child ever buy his or her own food? What sorts of things do you think make your child more likely to buy food?

As with all of the in-depth interview questions, follow up questions and additional probing were used to expand on participants' initial responses. The instruments were developed by considering the research questions and by expanding upon previous qualitative work that has been done with this population^{176,203}. An iterative process was used to refine the interview guides throughout the data collection

process; as the research team met regularly to discuss the information being collected and added additional questions to expand upon emerging themes.

In addition to the efforts used to develop the interview guides, the interviewers were encouraged to use the interview guides in a flexible fashion, as an unstructured questionnaire to guide discussion topics. This allowed for participants to be partners in directing the interview process allowing them to spend time discussing related topics of importance, however, this also created variation of the breadth and depth to which each topic was covered in each interview.

Training of Data Collectors. The data collection team for the formative research component consisted of 9 graduate student interviewers. All interviewers were formally trained in qualitative research methods including conducting in-depth interviews and qualitative data management and analysis. As part of their training interviewers received critique on their interviewing skills, and were provided strategies for improvement. Each interviewer received extensive training on the goals of the formative research data collection, the in-depth interview guide (including multiple opportunities to provide input on the design of the interview guide), and strategies for collecting rich qualitative data through probing questions.

Participant Recruitment and Selection. Participant recruitment for the formative research components took place at community locations (recreation centers, small retail food stores, etc.) within a sub-set of the neighborhood zones selected for the BHCK intervention (Chick Webb, John Eager Howard, Patapsco/Cherry Hill, Greenmount, Edgewood, and Bentalou). Recruitment was aided by the support of

community collaborators, specifically recreation center directors. This sub-set of neighborhood zones were selected as recruitment sites because they provided a sampling of participants from East, West, and South Baltimore, and because of strong relationships between the study staff and the community collaborators in these areas.

At these the recreation centers and small retail food outlets, youth and caregivers were referred to the study staff by community collaborators or directly approached by study staff. The study staff described the qualitative interview process to potential participants using IRB-approved recruitment scripts. If an individual agreed to participate, contact information for the youth and caregiver was collected, and eligibility was confirmed over the phone or in-person with the adult caregiver. To be eligible for interviews, youth had to be between 9-15 years old and live in a neighborhood zone participating in the BHCK study; caregivers had to be primary caregivers of an eligible youth. Within the cohort of eligible participants, qualitative interview participants were selected via purposive sampling with a goal of recruiting as many matched caregiver-youth dyads as possible. Adult consent (for caregiver interviews) or parent consent and child assent (for youth interviews) were collected prior to the data collection. In instances where youth were interviewed, but caregivers were not interviewed, the youth were allowed to take the parental consent forms home to be signed and returned prior to the interview.

Unfortunately, direct metrics of participant refusal rates were not recorded. In general, refusal rates for participating in interviews were low among individuals referred to the program by community collaborators, however, when youth and/or adults were

approached directly by study staff, refusal rates were significantly higher, especially if a youth was approached without a caregiver present. Anecdotally, lack of time and lack of interest were the most commonly cited reasons for not participating given by caregivers. The biggest barrier for youth participation was forgetting to return signed parental consent forms. Recruitment of interview participants continued until saturation of information was reached, meaning that additional interviews were no longer providing novel data²⁰⁵.

In-depth Interview Procedures. The majority of the in-depth interviews with both youth and adult caregivers were conducted in semi-private locations in recreations centers in the BHCK neighborhood zones. A few additional interviews were conducted outside corner stores, at local libraries, or at after school programs. Despite efforts to conduct the interviews with as much privacy as possible, the settings in which the interviews were conducted were prone the interruption. In general, the information collected during the interviews was related to eating behaviors and physical activity, and not overly sensitive, which made the potential for interruptions less of an issue. All interviews began by asking the respondent for permission to audio record the session, and permission was granted for all interviews. Youth interviews started with the question “could you take me through your typical day?” and the caregiver interviews started with the question “what is your favorite food?” This was designed to start the interview with a response that all participants could provide easily, making the participant feel comfortable and to start to establish rapport between the interviewer and the participant.

The caregiver interviews lasted from 20 to 75 minutes. The youth interviews lasted from 25 to 55 minutes. Given the age and developmental stage of the youth participants, interviewers were trained to watch for signs of participant fatigue and to adjust interview strategies or to allow for “breaks” in the interview if participants began to seem tired or disinterested in the interview. Youth and adult caregiver participants were each given a \$20 gift card upon completion of the interview, as compensation for their time.

Transcription and Data Storage. Audio recordings of all in-depth interviews were downloaded from the audio recording devices and transcribed verbatim either by the interviewer or by a BHCK research assistant. If the transcription was done by a research assistant, the interviewer reviewed the transcript for accuracy and made adjustments as needed. Transcripts were not verified with research participants. Audio files and transcripts were organized through a coordinated file-naming system and uploaded into the Atlas.ti software system for coding and analysis. All audio files, transcripts, and Atlas.ti files were stored on password-protected computers in the PI’s offices.

3.5.2 Phase 2 Data Collection (BHCK Baseline Data Collection)

The BHCK obesity prevention intervention is a cluster-randomized controlled trial designed to identify changes over time in the intervention versus comparison conditions. In the first wave of the study seven of the recruited neighborhood zones (neighborhood zones include both the recreation center and the surrounding food stores participating in the BHCK intervention) were randomized to the intervention

condition, and the other seven were randomized to the delayed intervention comparison condition. To assess the impact of the study, the research team measured a sample of youth and adult caregiver dyads from both intervention and comparison neighborhoods both before (baseline) and after (post) the intervention. The measurements taken by the research team included variables in which we expected to see changes among youth and adult caregivers being exposed to the intervention components.

The assessments performed with youth participants contained two components a dietary intake assessment, which was measured via the Block 2004 Kids Food Frequency Questionnaire (FFQ) and a Child Impact Questionnaire (CIQ). The CIQ component assessed: demographics; food purchasing (frequency, location, items purchased, amount spent); food preparation; psychosocial factors (behavioral intentions, outcome expectancies, self-efficacy, knowledge); change agent roles; support for healthy and unhealthy eating; and anthropometrics. The assessments performed with the adult caregivers contained an Adult Impact Questionnaire (AIQ) that assessed: demographics; household food purchasing (frequency, location, items purchased, and amount spent); food preparation; psychosocial factors (self-efficacy, behavioral intentions, knowledge, health beliefs and attitudes); supplemental food program participation; household income; household food security, and anthropometrics.

The analyses conducted for this thesis research involve cross-sectional examinations of a sub-set of the data collected as part of the study's baseline

assessment. Specifically, from the child interviews the dietary, demographic, and anthropometric data, plus the change agent questionnaire, and support for healthy and unhealthy eating questionnaire were used. From the adult interviews, household income data was used. For clarity and brevity purposes, we will focus the rest of this section only on the measures used in this thesis. Data on the other measures collected from both the youth and adult caregivers at baseline is in the process of being published in peer-reviewed journals^{28,206}.

Questionnaire Development and Pilot Testing. The questionnaires adapted for this thesis research include: the support for healthy and unhealthy eating questionnaire and the change agent roles questionnaire. In addition, diet quality scores measured by the Healthy Eating Index-2010 (HEI) were calculated from the dietary intake data provided by the Block 2004 Kids FFQ.

Social Support for Healthy and Unhealthy Eating Questionnaire. This questionnaire was selected from the published literature on adolescent social support¹⁵⁰ and was based on previously validated scales^{151,207}. The social support questionnaire used four scales to measure four different aspects of social support: support from friends for healthy eating, support from friends for unhealthy eating, support from parents for healthy eating, and support from parents for unhealthy eating. The scales asked the youth participant to report how often their friend or parent performed a certain task that supported healthy or unhealthy eating activities (see Appendix B for the complete questionnaire). Participants could respond to each question on a 5-point Likert scale with the following range of responses and scoring: never= 0 points; very

often = 4 points. Responses were scored and summed for each of the four scales. The scales that measured friend/parent support for healthy eating each contained 4 items (possible range 0-16, Cronbach's alphas=0.77 and 0.67 for friend and parent scales, respectively), and the scales that measured friend/parent support for unhealthy eating each contained 3-items (possible range 0-12, Cronbach's alphas= 0.59 and 0.52 for friend and parent scales, respectively). Despite being similar to that what was seen in the literature previously¹⁵⁰, the Cronbach's alpha values for both support for unhealthy eating scales were low and needed to be addressed. To address this, the item-test and item-rest values were assessed for each of the questions in the support for unhealthy eating scales to determine the effects of dropping questions from the scale. These tests found that dropping one question (*how often do your friends say nice things about the sweet or high fat foods you were eating?*) from the friend support for unhealthy eating scale improved the alpha for that scale to 0.64, thus the revised scale was used in the data analysis. Unfortunately the parent support for unhealthy eating scale was not able to be improved through adjustments in the scale. This scale remained unchanged in the analyses, and additional post-hoc measures were taken to further assess the issue of the low alpha value.

Change Agent Questionnaire. The Change Agent questionnaire used in this investigation was adapted from the adult literature²⁰⁸. The 7-item questionnaire sought to determine whom youths' perceive to be individuals (i.e., "change agents") who are supportive of health behavior change related to eating and physical activity. Each of the seven questions began by asking the youth if they have anyone in their life that

performs selected supportive roles for them (for the complete set of questions, see Appendix B). The youth could respond 'yes' or 'no'. If the youth provided an affirmative response, they were then asked to identify all of the people in their life who performed that role. Response categories were created based on the literature^{203,204,208}. Responses included: parents, grandparents, siblings, other family members, friends, mentors, teachers, doctors, and other. This scale was used descriptively rather than to create a cumulative score, making it unnecessary to run statistical tests to evaluate the scale itself (i.e., measures of internal consistency)

Healthy Eating Index (HEI) Scoring. In this study, the HEI scores were calculated from the output of the Block 2004 Kids FFQ. The Block Kids 2004 is a semi-quantitative FFQ that asks about frequency and amount of consumption of 77 food items, and is based on NHANES 1998-2002 data²⁰⁹⁻²¹¹. The instrument has been validated in minority youth²⁰⁹ and used in large trials with minority populations¹⁹¹.

HEI-2010 measures diet quality by providing a standardized summary score on a scale of 0 to 100, with higher values indicating increased diet quality. HEI consists of 12 component scores (whole fruit, total fruit, total vegetables, greens and beans, whole grains, dairy, total protein foods, seafood and plant proteins, fatty acids, refined grains, sodium, empty calories), which are summed to provide the overall HEI score. The HEI is a strong measure of diet quality because: it assesses the quality of the overall diet, yet allows for assessment of different elements of the diet via sub-component scores; it measures diet quality independently of total calorie intake (all component scores are converted to metrics that are on a per 1,000 kilocalorie scale); it is culturally relevant to

most groups and validated for use in minority youth²⁰⁹; and it does not require any specific food to be eaten to achieve a perfect score^{212,213}.

The FFQ data was first analyzed by the Nutrition Quest company (Nutrition Quest, Berkley, CA). The output of this initial analysis provided the necessary variables to calculate the HEI scores. Some variables needed to create HEI scores were not immediately available from the FFQ output, and had to be modified slightly and calculated. For example, the 'empty calories' component of the HEI is calculated by summing the amount of added sugars, solid fats, and alcohol in the diet. The Block 2004 Kids FFQ does not assess alcohol consumption, as it a measure for youth, therefore in this study the empty calories component was modified by summing only the amounts of added sugar and solid fat. A complete description of the calculations can be found elsewhere²⁰⁶.

Pilot Testing. Prior to implementation of the baseline assessments, all measures in the CIQ were pilot tested in a sample of 10 African American youth, ages 9-14, who attend a local recreation center. To avoid potential contamination, the pilot testing was done at a recreation center that was not participating in the BHCK study. From this pilot test, we assessed the ability of youth to understand and answer the questionnaire questions. We also examined some basic scale metrics, such as internal consistency (measured by Cronbach's alpha), and variation in responses from participants. If there was low variation in the pilot test participants' responses (for example, if all participants answered one of the questions with the same response) or if questions reduced the internal consistency of a scale, the scale was modified accordingly. A second round of

analysis of scale metrics and adjustments were also completed after the final data set was collected to insure the strongest measurements possible.

Data Collector Training. Data collectors were public health graduate students and BHCK study staff members. All data collectors received extensive training from the PI on all data collection survey instruments. For new data collectors the training process included a 2-day workshop, observing experienced data collectors administer the instruments, and being observed by and receiving feedback from experienced data collectors. In addition, each data collector was supplied a written manual of procedures for data collection. Booster training sessions were conducted periodically and any issues that arose in the data collection process were discussed in weekly study team meetings.

Participant Recruitment, Selection, and Randomization. Participant recruitment for the baseline data collection took place at community locations (recreation centers, small retail food stores, shopping centers, swimming pools, community events, etc.) within each of the 14 BHCK neighborhood zones. Recruitment was aided by the support of community collaborators, specifically recreation center directors.

At these locations youth and adult caregivers were referred to the study staff by community collaborators or directly approached by study staff. The study staff described the baseline data collection process to potential participants using IRB-approved recruitment scripts. Participants were eligible to participate in the baseline data collection if they: were living in one of the 14 neighborhood zones participating in Wave 1 of the BHCK study; had lived in the neighborhood for at least 1 year; did not

anticipate moving within the study timeframe; were between the ages of 9 to 15 years old or were the adult caregiver of a youth ages 9-15 years old. If a youth and/or adult caregiver agreed to participate, contact information for the youth and caregiver was collected, and eligibility was confirmed over the phone with the adult caregiver.

Eligible youth and adult caregiver dyads were randomly selected to participate in the baseline data collection through a process of creating sampling frames for each neighborhood. To create the sampling frames, the names of 75 or more eligible dyads were entered into the frame, and 20-24 youth were randomly selected from each neighborhood (based on the calculated sample size of the parent study)²⁸. If a randomly selected dyad was unable to participate, then the next eligible dyad was chosen from the randomized sampling frame. Due to the difficulty of following up with recruited participants this population, some of the neighborhoods required calling most of the names in the sampling frame to reach the final sample size. A total of 297 participants met the eligibility requirements, were enrolled in the study, and completed the baseline assessment.

Data Collection Interview Procedures. Baseline data collection interviews took place in-person at the participants' homes, local recreation centers or libraries, or other semi-private community locations that were convenient for the participant. Data collection in private homes was prioritized as it provided the most privacy for the interview and reduced participant burden. The majority of the baseline data collection interviews were completed by two data collectors, who were able to simultaneously interview the adult caregiver and the child, however, in instances where the child and

adult caregiver were unavailable at the same time, separate data collection appointments were permissible, provided that all consent and assent forms were completed prior to the interview.

Child interviews started with the administration of the FFQ, followed by the CIQ. Data collectors used a two-dimensional portion estimation aid worksheet provided by the Nutrition Quest corporation to assist in collecting accurate portion size information on the FFQ. Anthropometric measures were taken toward the end of the interview with a Seca 213 Portable Measuring Rod stadiometer (Seca Corp., Hamburg, Germany) and a Tanita BF697W Duo Scale (Tanita Corp., Tokyo, Japan), using standard procedures. All anthropometric measurements were taken twice, if the first two measures were inconsistent (greater than 0.2 pounds and 0.25 inches apart, respectively) a third measure was taken. The repeated measures were averaged and zBMI was calculated from these measures. Child interviews generally lasted 60-90 minutes, and youth received \$30 in gift cards upon completion of the interviews. Due to the length of the interview and the developmental stage of the youth participants, data collectors were trained to watch for signs of respondent fatigue, and were allowed to provide the participant with breaks during the interview as needed to increase attentiveness.

Adult caregiver interviews administered the AIQ and collected anthropometric data using the same procedures as the child interview. These interviews were shorter than child interviews, usually last approximately 60 minutes, and adults received a \$20 gift card upon completion of the interview.

Data Entry, Cleaning, and Storage. Upon completion of the child and adult interviews, the paper data collection forms were returned to the PI's offices. Designated study staff removed identifiers from the paper copies of the data and reviewed the questionnaires for completeness and accuracy. If missing variables were identified at this stage, participants were called to retrieve the missing data. Data were then entered into Microsoft Access databases, using methods outlined in a manual of procedures that was created to increase consistency and accuracy of data entry. Once the data entry was complete, the data was visually inspected and descriptive statistics were run and reviewed to identify data entry errors. De-identified paper copies of completed questionnaires and copies of the electronic database are kept in locked file cabinets and password-protected computers in the PI's office.

3.5.3 Phases 3 and 4 Intervention Development and Data Collection

The third phase of this thesis focused on the development and implementation of the youth-leader component of the BHCK intervention, and the fourth phase focused on the evaluation of the youth-leaders. The purpose of the youth-leader intervention was to engage Baltimore youth in the BHCK program by having the behavior change messages endorsed and intervention sessions delivered by cross age peers (i.e., youth-leaders). Cross aged peers are generally seen as relatable, credible, and acceptable sources of new information and have the potential to serve as role models of healthy behaviors²¹⁴.

The youth-leader's primary role was to deliver nutrition intervention sessions to younger youth in recreation center after school programs. As the BHCK program was

developed, the youth-leaders' role expanded into helping deliver intervention sessions in corner stores, generating social media content, and serving as spokespeople for intervention messages on posters, videos, and handouts. Much of the youth-leader intervention was guided by our partnership with New Lens. This process started by developing the curriculum components that the youth-leaders would deliver in the recreation centers, followed by pilot testing of the cooking curriculum. During the pilot-testing phase, we concurrently worked with New Lens to develop a training plan to provide youth-leaders with the skills needed to implement the curriculum effectively and serve as positive role models for healthy eating and activity behaviors. Together with New Lens, we implemented the youth-leader training program, and took several steps to evaluate the impact of the program on the youth-leaders. Detailed information on the on each of these steps is located in the following sections.

BHCK Youth-leader/Recreation Center Curriculum Development. The BHCK intervention targeted three primary dietary behaviors of youth ages 10-14: drinking healthy beverages, eating healthy snacks, and cooking healthy food at home. These three behaviors were selected because each behavior represents an area where selection of less healthy alternatives (consumption of sugary drinks, high calorie snacks, and eating out) could provide a significant number of “empty” calories. Each of these dietary behaviors also represents an area where youth have a certain amount of behavioral control. For example a child could modify snacks they purchased from the corner store to make healthier choices, but it would be more difficult for them to

modify the healthfulness of dinner meals at home, as parents/caregivers often have more control of family meal preparation.

Focusing on these three main dietary behaviors assured that the behavior change messages across all the intervention levels (in stores, at recreation centers, via text messages and on social media) were clear, consistent, and reinforcing. For each of the three target areas, a two-month intervention 'phase' was developed that included materials and messaging tailored for each of the intervention levels. At the youth-leader level, this involved a series of 14, hour-long intervention sessions delivered by the youth-leaders to younger youth attending recreation centers in each of the intervention neighborhood zones.

In order to appropriately develop interventions sessions to be delivered in each recreation center, site visits were conducted at recreation centers in each of the intervention neighborhood zones. The site visits included: direct observations of the recreation center programming and meals provided at the center, observations of youth attendance patterns at the recreation center, evaluation of available recreation center facilities, and assessment of current nutrition and health-related programming occurring at the recreation center. From these visits we learned that recreation center attendance was highest and most consistent in the after school programs (generally occurring from 3:00 to 5:00pm) with some youth arriving late or leaving early; most recreation centers had large multi-purpose or gymnasium space that could be used, but kitchen space and food preparation equipment was often limited; and that all of the recreation centers had time for nutrition programming built into their schedules, but

there was little consistency and limited support for actually implementing the nutrition programming.

Considering this information about the structure of the recreation center, the BHCK intervention sessions in the recreation centers were designed to be 1-1.5 hours long, to fit within the after-school program time, and to consist of three components, where youth could join in all three components or participate in any of the individual components within a session and still receive beneficial programming. The three components of each session included: (1) a short icebreaker activity and an interactive educational component where key information was provided (2) an activity or game that reinforced the educational messages and (3) a taste test of a healthier product promoted by the intervention.

Each of the three targeted phases (drinks, snacks, and cooking) contained 4 intervention sessions that were delivered by the youth-leaders twice per month at each recreation center. Additional funding focused on breakfast consumption was received for the youth-leader component, which prompted the addition of a smaller 2-session phase on healthy breakfasts. The concepts delivered during each of the sessions that occurred within the phases built on each other, but the intervention as designed to be inclusive to all recreation center attendees, therefore youth did not need to attend all of the sessions to participate or understand the concepts in each lesson.

The activities and educational materials used in the BHCK curriculum, consisted of a combination of new content designed for this intervention and pre-existing materials. The new intervention materials designed for this program included a series

of three short videos and four cooking classes that would be conducted during the 'healthy cooking at home' phase. Pre-existing materials were used for the drinks, snacks, and breakfast phases because there are several well-developed, nutrition curriculums available via the internet for these topic areas. The majority of the pre-existing materials were adapted from the 'Food and Fun' After School Curriculum by the Harvard Prevention Research Center and the Harvard School of Public Health (available: <http://www.hsph.harvard.edu/prc/projects/food-fun/>).

After relevant pre-existing curriculum activities were identified, they were modified to fit within the BHCK intervention structure by the study team. Then they were reviewed, and modified to enhance cultural relevancy by youth staff from New Lens. New Lens youth staff and adult staff provided multiple rounds of feedback on the curriculum, which were discussed in a collaborative, iterative process before being adopted by the BHCK study team. Table 3.2 provides an overview of the BHCK curriculum components. Appendix D provides example lessons from the BHCK recreation center curriculum, and the full curriculum is available to be downloaded at healthystores.org.

Intervention Video Development. A series of three short Youtube videos were developed in partnership with New Lens to supplement the BHCK recreation center intervention materials. In meetings with our partners at New Lens, the BHCK staff provided the nutrition information to be delivered in the videos. The New Lens team then created concepts and content for each of the videos. The videos include: a hip-hop video encouraging healthy food choices, a corner store scenario about healthy food

Table 3.2: Recreation Center Curriculum

BHCK RECREATION CENTER -- CURRICULUM MATRIX				
Session	Theme	Educational Content	Activities	Giveaway/ Taste Test
BEVERAGES				
1	Rethink Your Drink	<ul style="list-style-type: none"> • Why we eat sugar (energy for body/ brain) • Why should we avoid too much sugar • Some low-sugar drink options 	<ul style="list-style-type: none"> • Rap Video • Sweetened beverage 'tag' game 	<ul style="list-style-type: none"> • Crystal light/ Sugar free Kool Aid • BHCK sunglasses
2	Stoplight Beverages	<ul style="list-style-type: none"> • Introduce stop light method for selecting drinks • Work with youth to categorize a selection of beverages (water, low fat milk, fruit juice, soda) 	<ul style="list-style-type: none"> • Healthy beverage bowling 	<ul style="list-style-type: none"> • Diet half and half • BHCK drawstring bags
3	Why Water?	<ul style="list-style-type: none"> • Function of water in the body • Effects of dehydration 	<ul style="list-style-type: none"> • Body water sketch • Water obstacle course 	<ul style="list-style-type: none"> • Water with fruit • BHCK water bottle
4	Fruit Imposters	<ul style="list-style-type: none"> • Fruit has sugar in it, but it is okay to eat • What is fiber? How does it affect our bodies? • Slow vs. fast carbs 	<ul style="list-style-type: none"> • Food for Thought Video • Fruit Imposter Relay 	<ul style="list-style-type: none"> • Whole fruit (oranges) • Grape or orange stress balls
SNACKS				
5	Healthy snacking behaviors	<ul style="list-style-type: none"> • Discuss the purpose of snacks • Discuss some healthy snack options • Provide tips on healthy snacking behaviors 	<ul style="list-style-type: none"> • Healthy Battle Video • Snack Jeopardy game 	<ul style="list-style-type: none"> • Low-fat string cheese or yogurt
6	Snack Alternatives	<ul style="list-style-type: none"> • Explain why it is unhealthy to eat too much fat and salt (it can make you feel 'slow', leads to health problems) • Explain why it's bad to eat too much sugar (the crash) 	<ul style="list-style-type: none"> • Fat/sugar measuring activity • Smart Snacking skits 	<ul style="list-style-type: none"> • Granola bars
7	Snack Sleuth	<ul style="list-style-type: none"> • Food companies spend big bucks to get you to buy food • Talk about common advertising tricks 	<ul style="list-style-type: none"> • Family Feud Game • Design a healthy food advertisement 	<ul style="list-style-type: none"> • Baked chips
8	Stoplight Snacks	<ul style="list-style-type: none"> • Review the stoplight method for selecting foods • Discuss how to identify snacks in each category at the corner store 	<ul style="list-style-type: none"> • Red light, green light, eat right game 	<ul style="list-style-type: none"> • Fruit

BHCK RECREATION CENTER -- CURRICULUM MATRIX

Session	Theme	Educational Content	Activities	Giveaway/ Taste Test
BREAKFAST				
9	Breakfast as an on-the- go snack	<ul style="list-style-type: none"> Discuss breakfast benefits (with schedule activity) Generate ideas for fast, healthy, portable breakfast 	•Breakfast benefits obstacle course	•Low sugar cereal
10	Stoplight Breakfasts	<ul style="list-style-type: none"> Review the stoplight method for selecting food Review the purpose and benefits of breakfast Identify foods in the corner store that could serve as a healthy breakfast 	•Healthy House game	•Whole wheat breakfast option (waffle, bagel)
COOKING				
11	Cooking 1	<ul style="list-style-type: none"> How to create a veggie omelet and an omelet with lean meat How to crack eggs and use a whisk 	Power-Up Omelet recipe	Omelets
12	Cooking 2	<ul style="list-style-type: none"> How to create crunchy parmesan chicken strips without deep frying the chicken How to cut boneless chicken breast into strips Being safe when handling raw meat including sanitizing and proper cooking temperatures. 	What's Cluckin' Crispy Chicken Healthy Cooking Video	Crispy Chicken Nuggets (with salad)
13	Cooking 3	<ul style="list-style-type: none"> How to make healthier ramen noodles How to boil noodles How to reduce the sodium when eating ramen noodles 	Noodle Re-design	High Energy Noodles
14	Cooking 4	<ul style="list-style-type: none"> How to make a quesadilla How to using cooking spray instead of higher fat alternatives (butter, margarine) when making meals 	Crazy Quesadillas & homemade salsa	Quesadillas and salsa

purchasing, and documentary-style video showing young people discussing barriers and strategies for healthy eating. New Lens youth performed and filmed the videos. Collaboratively, BHCK and New Lens staff edited the videos to develop the final products, which were incorporated into the intervention sessions. The videos are publically available on youtube (https://www.youtube.com/results?search_query=bhck1).

Cooking Class Intervention Development and Pilot Intervention. The four sessions of the “healthy cooking at home” phase consisted of a series of four cooking classes. These classes were developed through our partnership with New Lens and with supplemental funding from the Kids Cook Monday Campaign (<http://www.thekidscookmonday.org>). The development of these cooking classes focused on identifying recipes that were healthier alternatives to foods that youth are currently consuming, and simple enough that the majority of ingredients could be purchased in a corner store.

To start, New Lens youth staff identified 8 recipe categories that met the above criteria, which included: omelets, mini pizzas, chili, quesadillas, crispy baked chicken, healthier ramen noodles, and pasta. The recipes were then broken down into steps that could be conducted by youth in a group setting, with specific details as to how youth-leaders were to lead the group in recipe preparation. The instructions included cooking techniques (chopping, grating, mixing, breaking an egg, etc.), food safety instructions (avoiding cross contamination, hand washing), and nutrition information to be taught to the youth participants in each cooking class.

To assess acceptability of the recipes and feasibility of implementation, the cooking classes were pilot-tested. The pilot test was delivered by youth staff from New Lens with support from the BHCK staff, and occurred at a recreation center that was ineligible for the BHCK intervention to avoid intervention contamination. The pilot took place from October to December of 2013, allowing all eight recipes to be tested in weekly cooking classes. Parental consent was obtained for nine youth ages 9 to 13 to participate in the cooking classes. Basic demographic, dietary intake, and food preparation information was collected from the participating youth before and after the pilot, and along with weekly feedback on the session/recipe.

After each session, the New Lens youth staff and BHCK staff met to discuss feedback and revisions to the curriculum. The four most successful recipes/sessions (omelets, healthy ramen noodles, crispy baked chicken, and quesadillas) were selected for inclusion in the BHCK curriculum.

Youth-leader Recruitment, Eligibility, Application and Selection. BHCK youth-leaders were primarily recruited with assistance from education settings. An IRB-approved flyer was distributed to local high schools, colleges, universities, and GED programs. We asked school staff (guidance councilors, professors in education and health-related fields, and administrators) to share this information with the students and encourage them to apply for youth-leader positions. The flyer included a program description, eligibility information (being between the ages of 15-22, being willing and available to participate in the entire intervention, and living in/near the City of Baltimore), the pay rate (\$10 per hour), and instructions for applying for the position.

A total of 135 applications were received. Each application was reviewed. Initial reviews were conducted by BHCK staff, whom assessed applications based upon: interest in the program, relevant experience, and application completeness. From this initial review, 41 applicants were selected for and completed in-person interviews. A BHCK staff person and a youth staff member from New Lens, conducted the in-person interviews and made joint decisions in the youth-leader selection process. The interview questions were developed by New Lens and adapted for the BHCK program, focusing on topics in the area of teamwork and leadership skills, rationale for interest in the position, and relevant past experiences.

During the recruitment and selection process the research team was informed by our partners at the Baltimore City Department of Recreation and Parks that all individuals working in the recreation centers must be over the age of 18, requiring us to modify the eligibility criteria for youth-leaders and making many of the original applicants ineligible. Despite this set back, a group of 16 young people were selected to be youth-leaders in the BHCK program.

Anecdotally, there were several common themes that youth-leader applicants described as reasons why they were interested in working as a youth-leader and several barriers that made participating difficult for those not selected for the positions. Youth often cited wanting the positions because: they enjoyed working with children, they felt a need to give back to the community, the position aligned well with their intended career path (the position was a part-time job that helped them build their resume), and they desired the opportunity to work for Johns Hopkins. Applicants who were not

selected for positions often had too many demands on their schedule, were leaving for college during the intervention timeframe, or had weaker abilities to work in a group/team setting.

Youth-leader Training. The youth-leader training consisted of 12 sessions, each session lasting 2-2.5 hours. The training sessions took place twice per week for six weeks from May to June 2014. The sessions occurred at the same approximate time that the youth-leaders would be delivering the interventions in the recreation centers. This was done intentionally, to begin to build the routine of dedicating that timeframe to the program and to identify early on any issues that could arise with tardiness and transportation, as many of the youth-leaders relied on public transportation to get to meetings and sessions at the recreation centers.

Each training session contained three main components: an ice-breaker/ team-building activity (lasting 5-10 minutes), youth-leader skill building activities (lasting 45-60 minutes), and time for youth-leaders to practice delivering of each of the curriculum lessons and receive feedback (lasting 45-60 minutes). Table 3.3 provides an overview of the youth-leader training components. Excerpts from youth-leader training plan are available in Appendix E, and the entire training plan is available at healthystores.org.

Ice-breaker/ team building activities were designed to build rapport among the youth-leaders, and introduce or provide a short preview of the youth-leader skill building topic for the day. The youth-leader skill building activities were designed and delivered by New Lens staff, who specialize in youth-leader development programs. The majority of the youth-leader skill building activities involved active learning, with

scripted role playing of various scenarios that would require critical youth-leadership skills (examples include: presentation and group facilitation skills, engaging disruptive youth participants in activities, dealing with different leadership styles, serving as a role model, the boundaries between being a youth-leader and friend, using downtime as an opportunity for individual mentoring, conflict resolution with other youth-leaders, and more). The youth-leaders were placed into small groups to perform each active learning scenario, after which the group collectively analyzed the scenario, and engaged in discussion and feedback on how to handle similar scenarios if they arise during the intervention implementation in the recreation centers.

Table 3.3: Youth-leader Training Overview

Session	Icebreaker	Youth-leader Skill Building Component	BHCK Curriculum Training
1	Baltimore Bingo	Program introduction & youth-leader responsibilities	N/A
2	2 truths and 1 lie	Group facilitation skills	Curriculum session 1
3	Name that leader	What is a leader?	Curriculum session 2
4	4 corners game	Being flexible	Curriculum sessions 3 & 4
5	Follow the hand	Handling conflict	Curriculum sessions 5 & 6
6	Room set-up challenge	Teaching & presentation skills (part 1)	Curriculum sessions 7 & 8
7	Stand up, sit down game	Be a (role) model	Curriculum sessions 9 & 10
8	High & low game	Mentoring during downtime	Cooking class 1
9	Guess that machine	Teaching & presentation skills (part 2)	Cooking class 2
10	Trust walk	Getting ready for each rec center session	Cooking class 3
11	Peer influence	Keys to communication	Cooking class 4
12	Cultural potluck	Dress rehearsal & celebration	Review & final preparation

After the skills development component, the youth-leaders spent the next portion of the training session getting acquainted with the curriculum. This component of the training was led primarily by the BHCK staff, and provided time for youth-leaders to review the intervention curriculum, ask questions about the curriculum, practice delivering the curriculum lessons to the group (implementing the youth-leadership skills

they learned in the first half of the training session), and receive feedback. Additionally, during this part of the training the youth-leaders were encouraged to provide feedback on the recreation center curriculum. If they identified curriculum components that did not make sense to them, or did not seem engaging, they were encouraged to provide suggestions to modify the teaching/ delivery method of the intervention materials. Each training session wrapped up with a brief, five-minute reflection on the session.

After the training was complete and the intervention implementation had begun, the youth-leaders and BHCK program staff continued to have 2-2.5 hour meetings/training sessions on a bi-weekly basis. These sessions functioned to allow for group feedback on the intervention, discussion of any issues, additional youth-leader skills development activities, and booster trainings on curriculum components. These sessions also functioned as times to enhance engagement of the youth-leaders in the program through celebrations of program successes/milestones, performing team building activities, and increasing rapport with program staff.

Youth-leader Data Collection. It is important to evaluate the impact of the intervention on the youth-leaders themselves as they receive the highest dose of the intervention from having to learn the curriculum and teach it to others. The evaluation of the impact of the BHCK program on the youth-leaders employed a quasi-experimental design. Multiple measurements were taken on the 16 youth-leaders involved in the intervention. In addition, a comparison group of 10 additional young people were selected to serve as controls for quantitative measures. The control youth-leaders were recruited from the pool of well-qualified applicants who applied to be

youth-leaders, but were for various reasons were deemed ineligible to participate (i.e., they were under the age of 18, they were preparing to leave for college during the intervention time frame).

Quantitative Youth-leader Data Collection. The quantitative data collection used in this thesis to assess the youth-leaders occurred at baseline and the end of the intervention (10 months). The quantitative data collection involved gathering information from both the 16 youth-leaders involved in the intervention and the 10 comparison youth-leaders.

A youth-leader Impact Questionnaire (YIQ) and the Block 2004 Kids Food Frequency Questionnaire were used in the quantitative assessments. The YIQ was modified from instruments used in the pediatric and adult literature^{32,150,165,168,208} and assessed: demographics, psychosocial factors (behavioral intentions, outcome expectancies, self-efficacy, knowledge) social support, and youth-leader skills. The FFQ measured dietary intake. Table 3.4 contains a description of each of the measures and Appendix C contains the complete questionnaire. After data was collected for each of the measures, scale scores were created (if appropriate) and scale metrics were assessed and adjusted to improve the internal consistency of the scale. One scale, the Nutrition Knowledge scale had questionable internal consistency (as measured by a very low Cronbach's alpha score =0.30), and was removed from the analyses.

Data collection interviews were conducted in-person in semi-private settings at the Johns Hopkins Bloomberg School of Public Health or at the participant's homes by BHCK staff members or graduate students. All interviewers received extensive training

from the PI on all study instruments and data collection procedures. To reduce participant bias and risk of coercion, BHCK staff members who regularly interacted with the youth-leaders as part of the intervention were prohibited from collecting impact interview information. Interviews lasted approximately 60 to 90 minutes and participants received \$30 gift cards for participating.

Once interviews were completed, the interview information was checked by project staff for completeness. Data was entered into Microsoft Access databases, using methods outlined in a manual of procedures that was created to increase consistency and accuracy of data entry. Once the data entry was complete, the data was visually inspected and descriptive statistics were run and reviewed to identify data entry errors. De-identified paper copies of completed questionnaires and copies of the electronic database are kept of in locked file cabinets and password-protected computers in the PI's office.

Qualitative Youth-leader Data Collection. In-depth interviews were conducted with each of the 16 youth-leaders at the midpoint of the intervention. The timing for these interviews was selected because it allowed the youth-leaders enough time to experience, and master some of the skills necessary to deliver the intervention, yet still identify initial and on-going challenges associated with intervention delivery. The interviews were conducted by the investigator, who has extensive training in qualitative research methods, including experience conducting interviews and focus group discussions with Baltimore youth. The goal of the interviews were to try to tease out characteristics about the youth-leaders that made them more or less successful in the

Table 3.4: Descriptions of Quantitative Measures Used to Assess Youth-leaders Pre- and Post- Intervention

Domain	Description
Demographics	<i>Demographics.</i> Demographic measures included self-reported age, gender, race/ethnicity, and education level.
Weight Status	<i>Anthropometrics.</i> Height and weight were measured in duplicate and averaged. In cases where participants refused measurement, self-reported height and weight measures were accepted (8% of measures). Participants were then classified by weight status (normal, overweight/obese) using appropriate methods BMI equation and standard cutoffs for participants >20 years old, and CDC BMI-for-Age growth charts and standard cutoffs for <20 years old.
Dietary Intake ^{24,28}	
Total Calories, Fruit Servings, Vegetable Servings	Three measures of dietary intake were assessed: total calories, fruit servings, and vegetable servings. These were measured using the Block 2004 Food Frequency Questionnaire for Kids, which is a validated semi-quantitative FFQ.
Psychosocial Factors ^{32,42,43}	
Self-efficacy	A 13 item scale asking participants to rate how confident they are in performing selected nutrition-related behaviors (example statement: I can eat a healthy breakfast even when I am running late for school or work). Participants could respond on a 4-point scale that included: I know I can (3), I think I can (2), I'm not sure I can (1), and I know I can't (0). Responses were summed to create the scale score (possible range 0-39, Cronbach's alpha=0.76)
Behavioral Intentions	A 9 item scale asking participants to report their intentions to make healthier or less healthy eating choices in the future. Each question had 3 different potential answer choices. (example question: If you had to choose a fruit snack, which would you choose? Answer choices: apples with caramel dip, grapes, or a fruit roll up). Responding with the healthiest choice (i.e., grapes) received 1 point, and all other responses receive 0 points. Points were summed to create the total score (possible range 0-9, Cronbach's alpha= 0.70).
Outcome Expectations	A 5 item scale asking participants to report if they believe statements linking eating behaviors and health outcomes are true or false (example question: I will gain weight if I eat a lot of fatty foods, like potato chips). Participants would respond by saying the statement was true, mostly true, mostly false or false. If the correct answer was, for example, 'true' then the participant would receive 2 points for responding 'true', 1 point for responding 'mostly true' and 0 points for incorrect answers of 'mostly false' or 'false'. Points were summed to create the total score (possible range 0-10, Cronbach's alpha= 0.72)
Social Support ^{20,21}	
Social Support for Healthy and Unhealthy Eating	A 14 item questionnaire taken from the literature where youth report the frequency of their caregivers or their friends providing social support for healthy and unhealthy eating behaviors. This questionnaire measures four scales, including: two four-items scales for parent and friend support for healthy eating (example question: How often do your parents/friends give you ideas on how to eat healthier foods?) and two three-item scales measuring parents/friends support for unhealthy eating (example question: How often does your parents/friends encourage you to eat high-fat foods or sweets?). Participants could respond on a 5-point Likert scale with responses scored as follows: never (0), rarely (1), sometimes (2), often (3), and very often (4). Scores were summed to create each scale (possible range for healthy eating support scales (0-16), possible range for unhealthy eating support scales (0-12), Cronbach's alpha's ranged from 0.78-0.90).
Leadership Skills ³³	
Youth-Leader Skills	<i>Youth-leader Skills.</i> Adapted from the youth-leadership literature, this 13-item scale assesses the youth-leaders confidence in their abilities to handle common tasks associated with the youth-leader role such as preparing for intervention sessions, problem-solving, and communication (example question: How confident are you that you teach a child to cook a healthy meal at home?) Participants could respond on a 4-point Likert scale with responses scored as follows: not at all confident (0), somewhat confident (1), confident (2), and very confident (3). Responses were summed and higher scores indicate higher youth-leader skill levels. (Possible range 0-39, Cronbach's alpha = 0.86)

program, to gain feedback on their experiences in the program, and to assess their thoughts and perceptions about the impact of the intervention. A complete list of interview questions can be found in the youth-leader in-depth interview guide in Appendix A. The information collected in these interviews was used to evaluate the intervention from the youth-leaders perspective and also to make improvements in future waves of the BHCK intervention.

The youth-leader interviews were done in private locations within the Johns Hopkins Bloomberg School of Public Health. All youth-leaders provided consent prior to participating in these interviews. The interviews lasted from 45 to 95 minutes in duration and the youth-leader participants were each given a \$20 gift card upon completion of the in-depth interview as compensation for their time.

As part of the procedures, the in-depth interviews were audio recorded. Audio recordings of all in-depth interviews were downloaded from the audio recording devices and transcribed verbatim either by the interviewer or by a BHCK research assistant. If the transcription was done by a research assistant, the investigator reviewed the transcript for accuracy and made adjustments as needed. The transcripts were not verified by the participants, however, the ongoing contact with the youth-leaders allowed for some level of verification of interview themes. Audio files and transcripts were organized through a coordinated file-naming system and uploaded into the Atlas.ti software system for coding and analysis. All audio files, transcripts, and Atlas.ti files were stored on password-protected computers in the PI's offices.

Youth-leader Intervention Implementation Evaluation. At least one BHCK staff member was present at each of the youth-led sessions at the recreation centers, to provide oversight to the youth-leaders and to serve as a process evaluator. Process evaluation data related to reach, dose, and fidelity of the intervention were collected on designated process evaluation forms at each intervention session. While a complete description of the process evaluation data from the youth-leader intervention is outside the scope of this dissertation, a brief description of the youth-led intervention implementation is presented Chapter 6 (Paper 3). The full process evaluation assessment is being published elsewhere²¹⁵.

3.6 ETHICAL CONSIDERATIONS AND DATA MANAGEMENT

The Institutional Review Board at the Johns Hopkins Bloomberg School of Public Health (IRB Number 0004203) approved all components of this thesis and the BHCK parent study. Parental consent and child assent were obtained prior to participation in evaluation activities with youth (including in-depth interviews, impact questionnaires and food frequency questionnaires). For data collection with the youth-leaders (in-depth interviews, impact questionnaires, and FFQs), parental consent and youth assent were collected from all youth leaders under the age of 18 and consent was collected from youth-leaders who are over the age of 18 prior to evaluation measures being taken.

All information provided by participants is kept confidential. No identifying information will be linked to study responses or published in any manner. A list of identifiers will be kept to contact participants if needed. This list will be kept in locked

files in the Principle Investigators offices in the Johns Hopkins Bloomberg School of Public Health. Only study staff will have access to this information. In addition, all information collected as part of the study (including audio recordings) will be keep in locked file cabinets or in password-protected computer files.

3.7 DATA ANALYSIS

3.7.1 Data Analysis Step 1: Cross-sectional Analysis of Baseline Data (Paper 1)

This analysis used baseline data collected as part of the BHCK study, specifically demographic data, dietary data, and data from the support for healthy and unhealthy eating scales. The goal of this analysis was to assess the relationships between diet quality (measured by the HEI-2010) and support from parents and friends for healthy and unhealthy eating.

Two initial multiple linear regression analyses were performed to assess the relationship between the dependent variable of HEI scores: and the independent variables of friend and parent support for healthy eating (model 1); and the independent variables of friend and parent support for unhealthy eating (model 2). Self-reported age, gender, race, and household income variables were included in all models as they are potential confounders, meaning they are hypothesized to have a causal relationship with both the independent and dependent variables²¹⁶ and need to be controlled for in the analysis. Weight status was not included as a confounder as we hypothesized that weight status may influence social support, but it is unlikely that weight status has a causal influence on the dependent variable of HEI score, and therefore does not meet our definition of confounding. Interaction terms were tested

in each model between parent support*friend support; parent support*gender and friend support*gender. However, they were dropped in favor of more parsimonious models because the interaction terms did not reach statistical significance at the $p < 0.05$ level in any of the regression models. All analyses were conducted using Stata IC 13.1 software (Stata Corp., College Station, TX) and statistical significance was set at $\alpha < 0.05$.

Post hoc regression analyses were run to assess the relationships between the 12 HEI component scores and parent and friend support for unhealthy eating, to determine if the relationship seen with overall HEI scores is consistent with component scores. To address concerns about the internal consistency of the support for unhealthy eating scales, an additional set of post hoc regression analyses were run to assess associations of overall HEI score with responses to each of the questions in the unhealthy support scale. Regression diagnostics were performed after each post hoc analysis. Based on the diagnostic tests, most of the HEI component variables were transformed to improve normality. We also allowed for heteroscedasticity in all of the component analyses except for the 'empty calories component', thus Huber-White sandwich estimators were used to estimate robust standard errors.

3.7.2 Data Analysis Step 2: Mixed Methods Analysis of Formative and Baseline Data (Paper 2)

This analysis used a convergent parallel mixed methods design where both quantitative and qualitative data were collected and analyzed in parallel, then the data

was merged so that the interpretation and discussion of the results was done in way at enhances both research methods²¹⁷.

The data used in this analysis includes both the formative research in-depth interview data (collected as part of Phase 1 of BHCK) and the baseline Change Agent questionnaire data (collected as part of Phase 2 of BHCK). Specifically, the youth in-depth interviews (n=38), parent in-depth interviews (n=10) and the Change Agent questionnaire data from the CIQ (n=297) were used.

For the quantitative data, descriptive statistics of the proportion of youth who reported affirmative responses to each item on the Change Agent questionnaire (i.e., they reported that they had someone in their life who performed the described supportive behavior), for each type of relationship (parent, grandparent, sibling, etc.) and overall were evaluated. Wald post-estimation tests were used to determine differences in the proportions of the relationships reported for each of the seven Change Agent questions. Statistical analyses were performed using Stata version 13.1 (StataCorp LP, College Station, TX).

Qualitative data analysis was guided by the principles of directed content analysis as described by Hsieh & Shannon²¹⁸. The interviewers reviewed the transcripts and generated an initial list of emerging themes. These themes, as well as several *a priori* codes of constructs from Social Cognitive Theory¹²⁵, Social Ecological Theory¹²⁴ and specific research questions, were used to develop a codebook that was iteratively modified and used throughout the coding process. A total of 32 codes were developed and grouped into categories such as family relationships, peer

relationships, and physical activity. Two initial transcripts were double-coded by the research team, discrepancies in code usage between coders were resolved, and the codebook was clarified accordingly. After the initial double-coding and codebook development, transcripts were coded individually. Researchers met routinely to ensure codes were applied consistently and discuss emerging themes. After all transcripts were coded, one research team member (EAS) reviewed all transcripts to assure consistency and to add new themes that emerged throughout the coding process.

In convergent parallel mixed methods studies, the qualitative and quantitative strands of data are merged at the interpretation phase. To do this, the research team used the stated research questions to guide interpretation of the results, by first exploring the results of each strand of data collection, then synthesizing a combined interpretation by layering the data collected from the different strands in addition to considering information provided by convergence of both strands and exploring areas of dissonance between the strands²¹⁷.

Triangulation methods were employed to enhance the credibility of the findings presented in this study. Mixed methods studies inherently incorporate methodological triangulation through the use of multiple data collection strategies (survey data, in-depth interviews). Source triangulation was employed in this study by collecting interview data from both youth and their adult caregivers. Finally, multiple researchers were involved in the design, data collection, analysis, and interpretation of this study, allowing for investigator triangulation^{219,220}.

3.7.3 Data Analysis Step 3: (Paper 3) Multiple Method Evaluation of the Youth-led Intervention Components

Paper 3 used quantitative and qualitative methods to perform a detailed examination of the youth-led intervention, with an emphasis on assessing the impact of the intervention on the youth-leaders themselves.

Quantitative data were collected from the youth-leaders (n=16) and comparison youth (n=10) at baseline and post-intervention. Less than 5% of data was identified as missing at random and dropped from the analyses. Only 1 comparison youth did not complete post-intervention interviews, otherwise a complete dataset was achieved.

The youth-leaders and comparison youth were selected by study staff to participate in their respective intervention groups, as opposed to being randomly assigned. Because of this, we were unable to assume that the groups were similar at baseline. To address the non-random assignment of youth-leaders, difference-in-differences analyses were used to assess changes in the groups over time. Difference-in-differences analyses reduce the effect of selection bias by comparing the average change over time in the intervention and comparison groups and avoids over-estimation of significance levels ²²¹. All analyses were conducted in Stata version 13.1 (Stata Corp., College Station, TX). The difference-in-differences analyses used linear regression models with the dependent variable being the outcome of interest, and included independent variables of time, treatment group, and a group*time interaction. Models controlled for potential confounding variables (age, gender, weight status) and corrected standard errors for the clustering of repeated measures. Alpha was set at $p < 0.05$.

Qualitative data analysis was guided by the principles of *directed content analysis* as described by Hsieh & Shannon²¹⁸. The coding team, made up of BHCK study staff and graduate students, reviewed the transcripts and generated an initial list of significant themes. These themes, as well as several *a priori* codes of constructs from relevant behavioral theories (Social Learning Theory¹²⁵, Social Ecological Theory¹²⁴, Diffusion of Innovations²²²) and specific research questions, were used to develop a codebook that was iteratively modified and used throughout the coding process. A total of 56 codes were developed and grouped into categories, for example: relationships between youth-leaders and participants, and intervention impact on youth-participants and youth-leaders. All coders coded two initial transcripts to identify and resolve discrepancies in code usage, and to refine the codebook. After the initial double-coding, transcripts were coded individually. Researchers met routinely to ensure codes were applied consistently, and to discuss emerging themes. After transcripts were coded, one researcher (EAS) reviewed all transcripts to assure consistency and to add new themes that emerged throughout the coding process.

Triangulation methods were employed to enhance the credibility of the findings presented in this study. Methodological triangulation was achieved through the use of multiple data collection strategies (survey data, in-depth interviews) and multiple researchers were involved in the analysis and interpretation of this study, allowing for investigator triangulation^{219,220}.

3.8 FUNDING

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**CHAPTER 4 PERCEIVED SOCIAL SUPPORT FROM FRIENDS AND PARENTS FOR EATING
BEHAVIOR AND DIET QUALITY AMONG LOW-INCOME, URBAN, MINORITY YOUTH
(PAPER 1)**

4.1 ABSTRACT

Objective: Evidence of associations between social support and dietary intake among adolescents is mixed. This study examines relationships between social support for healthy and unhealthy eating from friends and parents, and associations with diet quality.

Design: Cross-sectional analysis of survey data.

Setting: Baltimore, MD.

Participants: 296 youth ages 9-15 years, 53% female, 91% African American, participating in the B'More Healthy Communities for Kids study.

Main Outcome Measure(s): Primary dependent variable: Diet quality measured using Healthy Eating Index 2010 overall score, calculated from the Block Kids Food Frequency Questionnaire. Independent variables: Social support for healthy and unhealthy eating from parents and friends (measured on 2-4 item Likert scales), age, gender, race, and household income, reported via questionnaire.

Analysis: Adjusted multiple linear regressions. Alpha, $p < 0.05$.

Results: Higher levels of parent support for unhealthy eating were related to lower overall HEI scores ($\beta = -0.60$; $SE = 0.24$; $CI: -1.07$ to -0.14). Friend support for unhealthy eating, and friend and parent support for healthy eating did not have statistically significant relationships with overall HEI scores.

Conclusions and Implications: These results are novel and demonstrate the need for additional studies examining support for unhealthy eating. These preliminary findings may be relevant to researchers as they develop family-based nutrition interventions.

4.2 INTRODUCTION

Adolescents often fall short of recommended dietary intakes, consuming diets high in sugar and fat, and low in fruits and vegetables^{48,50}. Behavioral theories suggest that psychosocial factors, such as social support, can influence health behaviors^{126,223}. Studies among adults have found beneficial relationships between social support and health-related indicators including fruit and vegetable intake¹⁴¹, weight management¹⁴⁴, and physical activity¹⁴⁵.

The relationship between social support and diet-related health outcomes among adolescents has been studied far less than in adults. The few studies on adolescent social support report inconsistent findings¹⁴² and are limited in the number of dimensions of social support they examine^{146,149–154}. Traditional definitions indicate social support is always intended to be supportive of the health behavior of interest¹²⁶, however, adolescents may be receiving messages from their friends and parents that support unhealthy consumption. To date, only one study has examined the relationship between dietary intake and social support for both *healthy* and *unhealthy* eating as multidimensional constructs¹⁵⁰. The dearth of evidence regarding social support for unhealthy eating, combined with the mixed results of previous studies, indicates a need for additional examination. This study contributes to the literature by addressing the following research questions in a unique, high-risk population:

- How frequently do urban African American youth perceive that their parents and friends provide support for healthy and unhealthy eating?
- What are the relationships between perceived friend and parent support for healthy and unhealthy eating and diet quality among urban, low-income, African American youth?

Based on behavioral theory and the literature, the research team hypothesized that adolescents who perceive higher levels of social support for unhealthy eating from parents and friends will have poorer diet quality, and that adolescents who perceive higher levels of social support for healthy eating from parents and friends will have better diet quality.

4.3 METHODS

4.3.1 Study Design and Sample

This is a cross sectional analysis using baseline data collected in the B'More Healthy Communities for Kids study (BHCK), an obesity prevention intervention in Baltimore, Maryland²⁸. Eligibility criteria for this study included: living in a neighborhood participating in BHCK (low-income, African American, food desert neighborhoods); being 9-15 years old; and having a parent or guardian who was willing to provide consent for youth to participate.

Participants were randomly selected, through a process of creating a sampling frame for each neighborhood, then randomly selecting participants within each sampling frame. Details of the randomization are published elsewhere²⁸. A total of 296 participants met the eligibility requirements and completed the baseline assessment.

4.3.2 Data Collection and Instruments

Data Collection. Trained data collectors collected all data via in-person interviews between June 2013 and June 2014. Household income data was self-reported by the participant's adult caregiver. Caregivers and youth provided consent/assent prior to each interview. Interviews took approximately 60 minutes to complete, and youth received \$30 in gift cards for participation. This study was approved by the Johns Hopkins Bloomberg School of Public Health IRB.

Instruments. Data from youth were collected on two instruments – the Block Kids 2004 Food Frequency Questionnaire (FFQ) and a Child Impact Questionnaire (CIQ). The Block Kids FFQ is a validated, semi-quantitative, FFQ that asks about frequency and amount of consumption of 77 food items based on NHANES 1998-2002 data^{209–211}. The CIQ is a 79-item questionnaire that measured the demographic, anthropometric, and social support data used in this analysis.

Most demographic data used in the analyses (age, gender, race) were collected via youth self-report. Anthropometric data (height and weight) were measured and BMI-for-Age percentiles were calculated using standard procedures³³.

Social support data was collected from the youth via the CIQ, using a social support questionnaire published in the literature¹⁵⁰, based on previously validated scales^{151,207}. The social support questionnaire used four scales to measure four different aspects of social support: support from friends for healthy and unhealthy eating, and support from parents for healthy and unhealthy eating. The scales asked the participant to report how often their friend or parent performed a certain task that supported

healthy or unhealthy eating. Participants could respond to each question on a 5-point Likert scale (ranging from never= 0 points to very often = 4 points). Responses were summed for each of the four scales. The scales that measured friend/parent support for healthy eating each contained 4 items (Cronbach's alphas=0.77 and 0.67 for friend and parent scales, respectively), and the scales that measured friend/parent support for unhealthy eating each contained 3-items. Cronbach's alpha scores were low for the 3-item support for unhealthy eating scales (Cronbach's alphas= 0.59 and 0.52 for friend and parent scales, respectively), which may indicate problems with internal consistency of the scales²²⁴. These values are similar to that what was seen in the literature for this scale¹⁵⁰, however, should be improved. To address this, the friend support for unhealthy eating scale was modified by removing one question from the scale to increase internal consistency (revised Cronbach's alpha=0.64). The Cronbach's alpha for the parent support for unhealthy eating scale is not improved by modifying the scale, and all three questions were retained. Additional regression analyses were undertaken to further address this issue.

Calculation of the Healthy Eating Index 2010 Scores. Overall diet quality was measured by using the FFQ data to calculate the Healthy Eating Index (HEI) 2010²¹³ scores for each participant. HEI was selected as the dependent variable of interest because it provides a standardized summary score relating to the overall quality of the diet. HEI is a measure of diet quality that consists of 12 component scores, which are summed to provide the overall HEI score on a scale of 0-100.^{212,213}. Higher HEI scores (overall and for each component) indicate better diet quality, including scores for

components that have recommendations for ‘moderate consumption’ (refined grains, sodium, and empty calories)²¹³.

The dietary data for each participant was taken from the FFQ and converted to approximate HEI component scores. Details of these calculations are published elsewhere²⁰⁶. Similar to previous studies, individuals were excluded from the analyses if their daily caloric expenditure from the FFQ was reported as <500 or >5,000 kcal, or if their HEI score was ± 3 standard deviations from the mean¹⁷⁵, as these extreme values most likely represent issues with the accuracy of the FFQ data collection rather than actual participant intakes. A total of 18 youth participants were excluded due to these criteria, creating a final of n=278.

4.3.3 Statistical Analyses

Model Development. The regression models were created based on theoretical understanding of the relationships of interest and knowledge of the literature²²⁵. The primary independent variables of interest in the models are friend and parent support for healthy eating, and friend and parent support for unhealthy eating. Self-reported age, gender, race, and household income variables were included in all models as potential confounders, meaning they are hypothesized to have a causal relationship with both the independent and dependent variables²¹⁶ and need to be controlled for in the analysis. Weight status was not included as a confounder because weight status may influence social support, but weight status is likely a result of unhealthy eating rather than a cause of it, and therefore does not meet the definition of confounding. Interaction terms were tested in each model between parent support*friend support;

parent support*gender and friend support*gender. However, the interaction terms were dropped because they did not reach statistical significance in any of the regression models.

Data Analysis. Data analysis was conducted using Stata IC 13.1 software (Stata Corp., College Station, TX). Pearson's correlations were estimated between the four social support scales. The results of the correlation were low to moderate ($r = 0.05$ to 0.38) indicating that the four scales are measuring unique constructs, rather than opposite ends of the same construct.

Two initial linear regression analyses were performed to assess the relationship between the dependent variable of HEI scores and the independent variables of friend and parent support for healthy eating, and the independent variables of friend and parent support for unhealthy eating. Diagnostics were performed after each regression to check model assumptions. Multicollinearity statistics were run to confirm that the social supports scales did not result in problematic collinearity. Alpha was set at $p < 0.05$.

Post hoc analyses were conducted to further investigate the initial analyses. These analyses included assessments of the relationships between the 12 HEI component scores and parent and friend support for unhealthy eating, to determine if the relationship seen with overall HEI scores was consistent with component scores. To further explore potential concerns with internal consistency of the support for unhealthy eating scales, additional post hoc analyses included assessment of the associations of overall HEI score with responses to each of the questions in the

unhealthy support scale, to assess differences in these relationships that may exist, given the lower level of Cronbach's alpha scores of these scales.

Regression diagnostics were performed after post hoc analyses. Based on the diagnostic tests, some of the HEI component variables were transformed to improve normality (while this makes the regression coefficients difficult to interpret, the direction and significance of the relationships are unchanged). Tukey ladder of powers calculations were used to identify the best transformation. Based on diagnostic residual plots, heteroscedasticity was allowed for in all of the component analyses except for the 'empty calories component', using the Huber-White sandwich estimator to estimate robust standard errors.

4.4 RESULTS

Sample Characteristics. The sample was 53% female, predominately African American, with a mean age of 12.3 ± 1.5 years, and 68% from households reporting annual incomes of less than \$30,000/year (Table 4.1). The mean HEI score of the sample was 55.5 ± 9.6 , and 42% of the sample was classified as overweight or obese.

Perceived Social Support from Friends for Healthy and Unhealthy Eating. Table 4.2 shows the distribution of responses to each of the questions for social support for healthy and unhealthy eating from friends and parents. Over 60% of the sample reported their friends 'never' or 'rarely' provided social support for each of the four questions related to healthy eating. Related to support for unhealthy eating, 47% and 49% of participants reported that their friends offered them high-fat foods or sweets, or said nice things about the high-fat foods or sweets they were eating, 'often' or 'very

often', respectively. Youth reported that their friends encouraged them to eat high-fat foods or sweets less frequently, with 28% reporting this happening 'often' or 'very often'.

Perceived Social Support from Parents for Healthy and Unhealthy Eating. Most youth reported that their parents 'often' or 'very often' provide support for three out of the four questions in the healthy eating support scale (Table 4.2). Youth reported that for the most part, parents did not support unhealthy eating behaviors, with more than 40% reporting that their parents 'never' or 'rarely' offer them high-fat foods or sweets or said nice things about the high-fat foods or sweets they may be eating. Most youth also felt that parents did not encourage them to eat high fat foods or sweets, with more than 75% of youth reporting that this happened 'rarely' or 'never'.

Relationship between Perceived Social Support from Friends and Parents for Unhealthy Eating and HEI Scores. Parent support for unhealthy eating was significantly related to HEI scores (Table 4.3). As expected, lower levels of parent support for unhealthy eating, were associated with higher HEI scores ($\beta=-0.60$; $SE=0.24$; $CI: -1.07$ to -0.14 ; $p=0.01$). Friend support for unhealthy eating did not reach statistical significance ($\beta=0.25$; $SE=0.26$; $CI: -0.25$ to 0.76 ; $p\text{-value}=0.33$).

Relationship between Perceived Social Support from Friends and Parents for Healthy Eating and HEI Scores. No relationship was found between friend or parent social support for healthy eating and overall HEI scores (Table 4.3).

Relationship between Perceived Social Support from Friends and Parents for Unhealthy Eating and HEI Component Scores. Parent support for unhealthy eating was

statistically significantly inversely related to two HEI component scores (empty calories [$\beta=-0.34$; CI:-0.55 to -0.13; $p=0.002$], and total vegetables [$\beta=-0.02$; CI:-0.04 to 0.00; $p=0.05$]). Friend support for unhealthy eating was statistically significantly positively related to two HEI components scores (empty calories [$\beta=0.23$; CI:0.00 to 0.46; $p=0.05$], and total protein [$\beta=2.25$; CI: 0.49 to 4.02; $p=0.01$]). It is important to note, due to various forms of transformation used to make the outcome variables more normally distributed for select HEI component outcome variables (fatty acids, total protein, total vegetables) the beta values are difficult to interpret, however, the significance and direction of the relationship are unchanged. None of the other component scores were statistically significantly associated with parent or friend support for unhealthy eating (Table 4.4).

Relationship between overall HEI score and responses to each of the questions of the Unhealthy Support Scale. These post hoc analyses explore the relationships between each individual item on the support for unhealthy eating scale and overall HEI scores, allowing us to further explore these relationships given the low internal consistency of the support for unhealthy eating scales. In these models, responses to questions about parent support for unhealthy eating were inversely related to overall HEI scores, and responses to questions about friend support for unhealthy eating were positively related to overall HEI scores, however most of these analyses were not statistically significant (Table 4.5). The only statistically significant finding was the inverse relationship between parents' offering youth high-fat food or sweets and HEI scores ($\beta=-1.65$; SE=0.52; CI: -2.66 to -0.63; $p=0.002$).

4.5 DISCUSSION

This study provides new insight into the relationship between social support for healthy and unhealthy eating and diet quality in low-income, urban, African American youth. While some variation existed, youth generally perceived their friends to provide support for unhealthy eating more frequently and support for healthy eating less frequently. The opposite pattern emerged for parents, with youth reporting that parents provided support for healthy eating more frequently and support for unhealthy eating less frequently, which is consistent with the literature¹⁵⁰.

The results of the regression analyses examining parent and friend support for healthy eating did not follow the research team's a priori hypotheses, as they found no significant relationships with HEI scores. This is consistent with the findings of some¹⁵⁰ but not all others¹⁴⁶ that have investigated similar relationships.

As hypothesized, the model examining support for unhealthy eating found that lower levels of parent support for unhealthy eating were related to higher overall HEI scores. Some, but not all, of the analyses using the HEI component scores found similar results. Regarding friend support for unhealthy eating, there was no association between friend support for unhealthy eating and overall HEI scores. However, two of the component scores identified significant relationships where increased friend support for unhealthy eating was related to higher HEI component scores. The finding of higher levels friend support for unhealthy eating being related to better diet quality component scores was unexpected and should be interpreted cautiously. These findings are inconsistent with the results of Fitzgerald and colleagues¹⁵⁰, who found that

higher peer support for unhealthy eating was associated with unhealthy food intake. Stanton and colleagues¹⁵¹ also found an unexpected relationship where increased friend support for healthy eating was associated with increased fat intake. They hypothesized that youth who receive support for healthy eating from their friends, are receiving it because they may already be consuming a diet that is higher in fat/lower in diet quality¹⁵¹. To clarify the mixed results surrounding friend support for healthy and unhealthy eating and diet quality, future studies should gather additional data on the perceived healthfulness of friends diet habits and/or examine fluctuations in diet quality scores when social support from friends is manipulated.

4.5.1 Limitations

One limitation is the cross sectional design, which limits the conclusions that can be drawn from this analysis. Cross sectional data only allow for descriptions of the associations between the variables assessed, but can make no claims about causality. Another limitation of this analysis is the self-reported nature of the variables assessed. The social support scales used in this assessment are taken from the literature¹⁵⁰ and adapted from validated scales^{151,207}, however they could be improved. The low Cronbach's alphas for select scales indicates issues with internal consistency, and create an important limitation to this study. These concerns were addressed by modifying the friend support for unhealthy eating scale to improve internal consistency, and by conducting post hoc analyses that evaluated each question within the scale. Despite these efforts, results should still be interpreted with this limitation in mind. Further work needs to go into strengthening the reliability and validity of social support

measures, and increasing the number of dimensions or types of social support (i.e., support for healthy versus unhealthy eating) examined in such measures.

Accurate collection of dietary data is difficult without requiring procedures that are overly burdensome or cost prohibitive. In this analysis, FFQ data was used to calculate diet quality scores, and it is possible that the FFQ measures overestimated dietary intake^{226,227}. In the instance of this analysis, this is not particularly problematic because the HEI scores still allow for consistent ranking of diet quality among the participants, however this limits the transferability of the results to other samples.

Lastly, these analyses provide additional insight into the relationship between social support for healthy and unhealthy eating from parents and friends, but many questions remain. Additional research is needed to further explore and clarify these relationships with multiple dimensions, sources, and types of social support provided to adolescents along with other relevant factors to gain additional insight into drivers of diet quality among all adolescents.

4.5.2 Implications for Research and Practice

Traditionally nutrition interventions have focused on individual behaviors, and have taken a limited view on the scope of influence that social relationships play. The results presented here indicate that there may be important dynamics occurring between youth, and their parents and friends related to support for unhealthy eating behaviors that are associated with differences in diet quality. Moving forward, it may be important for researchers to expand their conceptualization of social relationships when developing nutrition interventions.

Table 4.1: Anthropometric and Sociodemographic Characteristics of the BHCK Youth Sample (n=278)

Gender, n(%)	
Female	146(53%)
Age (M\pmSD)^a	12.3\pm1.5
Race, n(%)	
Black, African American	252(91%)
Mixed race	23(8%)
Other race	3(1%)
Ethnicity, n(%)	
Hispanic / Latino	11(4%)
BMI Category, n(%)^b	
Underweight	3(1%)
Normal weight	157(57%)
Overweight	52(19%)
Obese	64(23%)
Overall HEI Scores, M\pmSD	55.5\pm9.6
Household Income (\$/year), n(%)^c	
0-10,000	75(27%)
10,0001-20,000	56(20%)
20,0001-30,000	58(21%)
More than 30,001	75(27%)
Did not respond	14(5%)

^aM \pm SD = Mean \pm Standard deviation

^bClassified by BMI-for-Age percentiles from CDC growth charts

^cSelf-reported by caregivers

Table 4.2: Youth's Responses to Social Support Questions Measuring Friend's and Parent's Support for Healthy and Unhealthy Eating, and Social Support Scale Scores (n=278)

How often do your friends/parents:	Relationship	Never (%)	Rarely (%)	Some-times (%)	Often (%)	Very Often (%)
Give you ideas on how to eat healthier foods?	Friends	45	21	21	7	7
	Parents	5	9	35	29	23
Offer you low-fat snacks?	Friends	40	22	19	12	7
	Parents	11	13	33	29	15
Encourage you to stay away from high-fat foods or sweets?	Friends	51	17	17	10	5
	Parents	8	11	25	25	31
Talk with you about eating more healthy foods?	Friends	47	15	19	12	6
	Parents	8	10	26	22	35
Offer you high-fat foods or sweets?	Friends	15	13	26	25	22
	Parents	21	27	37	9	6
Encourage you to eat high-fat foods or sweets?	Friends	28	18	27	18	10
	Parents	50	27	16	6	2
Say nice things about the sweet or high fat foods you were eating?	Friends	17	12	22	20	29
	Parents	27	19	30	14	10
Social Support Scale Scores (M±SD)^a						Total
Friend Support for Healthy Eating						4.6±3.9
Friend Support for Unhealthy Eating						3.9±2.3
Parent Support for Healthy Eating						10.1±3.4
Parent Support for Unhealthy Eating						4.0±2.5

^aScales are based on summed responses to questions using a 5-point likert scale rating how often friends/parents perform tasks from never=0 to very often=4. The support for healthy eating scales have 4 items (possible range=0-16); the support from parents for unhealthy eating scale has 3 items (possible range=0-12); the support from friends for unhealthy eating scale has 2 items (the question related to saying nice things about the sweet and high fats foods you were eating was omitted to improve internal consistency, possible range 0-8).

Table 4.3: Associations between Perceived Social Support from Parents and Friends for Unhealthy and Healthy Eating Behaviors and HEI Scores Overall (n=278)^a

Support for Unhealthy Eating		HEI Index Score	
	β	Std. Err.	P-value
Parent Support for Unhealthy Eating	-0.60	0.24	0.01
Friend Support for Unhealthy Eating	0.25	0.26	0.33
Support for Healthy Eating		HEI Index Score	
	β	Std. Err.	P-value
Parent Support for Healthy Eating	0.27	0.18	0.13
Friend Support for Healthy Eating	0.15	0.16	0.35

^a Higher HEI scores imply better diet quality. All models were controlled for age, gender, race, and household income. Age was entered as a continuous variable (range 9.45-15.28). Race was entered as 1= African American, 0= not African American. Household income was entered as a dummy variable with the units where 0=0-10,000; 1=10,001-20,000; 2=20,001-30,000; 3=30,001+; 4=participant declined to respond. Social support scales were entered as continuous variables (range 0-8 for the unhealthy support from friends scale, range 0-12 for the unhealthy support from parents scale and 0-16 for both healthy support scales). Interaction terms (friend support for (un)healthy eating*parent support for (un)healthy eating; friend support for (un)healthy eating*gender; parent support for (un)healthy eating*gender) were tested, but removed from the models due to lack of significance.

Table 4.4: Associations between Perceived Social Support from Parents and Friends for Unhealthy Eating Behaviors and HEI Component Scores (n=278)^a

Empty Calories Score^c	β	Std. Err.	P -value
Parent Support for Unhealthy Eating	-0.34	0.11	0.002
Friend Support for Unhealthy Eating	0.23	0.12	0.05
Sodium Score^d	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	0.04	0.06	0.46
Friend Support for Unhealthy Eating	0.00	0.08	0.95
Refined Grains Score^d	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	0.03	0.06	0.57
Friend Support for Unhealthy Eating	-0.09	0.07	0.21
Fatty Acid Score^{df}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.94	0.56	0.09
Friend Support for Unhealthy Eating	1.15	0.63	0.07
Seafood & Plant Protein Score^{eg}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.02	0.01	0.23
Friend Support for Unhealthy Eating	0.01	0.02	0.58
Total Protein Score^{eh}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.68	0.86	0.43
Friend Support for Unhealthy Eating	2.25	0.89	0.01
Dairy Score^{dg}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.01	0.02	0.72
Friend Support for Unhealthy Eating	0.00	0.02	0.89
Whole Grains Score^{dg}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.02	0.01	0.07
Friend Support for Unhealthy Eating	0.02	0.01	0.13
Beans and Greens Score^{eg}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.03	0.02	0.09
Friend Support for Unhealthy Eating	-0.02	0.02	0.28
Total Vegetables Score^{eg}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.02	0.01	0.05
Friend Support for Unhealthy Eating	0.00	0.01	0.54
Whole Fruit Score^{ef}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.21	0.21	0.30
Friend Support for Unhealthy Eating	-0.17	0.26	0.52
Total Fruit Score^{ef}	β	Robust SE^b	P -value
Parent Support for Unhealthy Eating	-0.17	0.21	0.41
Friend Support for Unhealthy Eating	0.11	0.24	0.66

^aAll models were controlled for age, gender, race, and household income. Age was entered as a continuous variable (range 9.45-15.28). Race was entered as 1= African American, 0= not African American. Household income was entered as a dummy variable with the units where 0=0-10,000; 1=10,001-20,000; 2=20,001-30,000; 3=30,001+; 4=participant declined to respond. Social support scales were entered as continuous variables (range 0-8 for the unhealthy support from friends scale, range 0-12 for the unhealthy support from parents scale). In all models interaction terms (friend support for unhealthy eating*parent support for unhealthy eating; friend support for unhealthy eating*gender; parent support for unhealthy eating*gender) were tested, but removed from the model due to lack of significance.

^bRobust SE = Robust standard errors calculated as Huber-White sandwich estimators

^cHEI component score was entered as continuous variable on a scale of 0-20.

^dHEI component score was entered as continuous variable on a scale of 0-10.

^eHEI component score was entered as continuous variable on a scale of 0-5.

^fHEI component variable was square transformed for this analysis

^gHEI component variable was square root transformed for this analysis

^hHEI component variable was cube transformed for this analysis

Note: transformation of outcome variables creates difficulty in interpreting the betas and standard errors, direction of the relationship and statistical significance, however, are not influenced by transformation

Table 4.5: Associations between Perceived Social Support for Unhealthy Eating Scale Questions and HEI Overall Scores (n=278)^a

Dependent Variable	HEI Overall Score		
	β	Std. Err.	P-value
Question 1: How often do your:			
Parents: Offer you high-fat foods/sweets	-1.65	0.52	0.001
Friends: Offer you high-fat foods/sweets	0.10	0.43	0.82
Question 2: How often do your:			
Parents: Encourage you to eat high-fat foods/sweets	-0.78	0.57	0.18
Friends: Encourage you to eat high-fat foods/sweets	0.61	0.45	0.18
Question 3: How often do your:			
Parents: Say nice things about high-fat foods/sweets you are eating	-0.80	0.49	0.10
Friends: Say nice things about high-fat foods/sweets you are eating	0.77	0.43	0.08

^aHigher HEI scores imply better diet quality. All models were controlled for age, gender, race, and household income. Age was entered as a continuous variable (range 9.45-15.28). Race was entered as 1= African American, 0= not African American. Household income was entered as a dummy variable where 0=0-10,000; 1=10,001-20,000; 2=20,001-30,000; 3=30,001+; 4=participant declined to respond. HEI Index overall scores were entered as continuous variables (range 0-100). Social support scales were entered as continuous variables (range 0-4), analysis checks were conducted to assure scale mimicked continuous distribution. Interaction terms (friend support for each question*parent support for each question; friend support for each question*gender; parent support for each question*gender) were tested, but removed from the models due to lack of significance

CHAPTER 5. SOCIAL INFLUENCES ON EATING AND PHYSICAL ACTIVITY BEHAVIORS OF URBAN, MINORITY YOUTH (PAPER 2)

5.1 ABSTRACT

Social interactions can impact eating and activity behaviors among adolescents; but the best strategies for intervening in the social environment are unknown. This study used a convergent parallel mixed methods design to identify and explore roles that multiple social contacts have with low-income, urban, minority youth ages 9-15 around eating and physical activity. Data were collected from 297 youth using structured questionnaires, and triangulated with in-depth interviews from 38 youth and 10 parents. Combined interpretation of the results found that parents and caregivers have multiple, dynamic roles influencing youth's eating and activity behaviors. Other social contacts (friends, other family, teachers, doctors) have specific, but limited roles. Obesity prevention programs should consider perceived social roles when designing interventions for urban minority youth.

5.2 INTRODUCTION

Previous studies show links between social relationships and obesity, providing some preliminary evidence that obesity may spread among social networks, resembling the spread of an infectious disease⁸⁹. Some social factors that influence dietary intake (i.e., social modeling^{16,19}, social norms^{15,20}, impression management²¹) have been identified, but a comprehensive understanding of the mechanisms through which social relationships facilitate the spread of obesity remains unknown and under-researched²²,

making it difficult for researchers to design and implement appropriate interventions targeting the social environment¹⁵⁵.

From a health perspective, adolescence is important because obese adolescents are more likely to become obese adults²⁷. Current obesity rates among adolescents are alarmingly high, and disproportionately impact low-income, racial and ethnic minority youth^{2,6,7}. Social influences may play a role in the development of obesity during early adolescence (ages 10-14) because early adolescence is the life stage when perceptions of others are highly valued, and there is a strong urge to conform to social norms^{23,24}. Early adolescence is also a period of shifting social dynamics. For example, adolescents begin spending more time in the presence of peers and friends^{23,25}. Adolescents also gain autonomy in their food-related decision-making, including having increased access to money to independently purchase foods²⁶. Studies examining food purchasing behaviors of urban, and racial and ethnic minority adolescents show that foods that adolescents purchase and consume when they are away from home are often high calorie and nutrient-poor (chips, candy, soda, fast food)^{26,61}. These purchasing behaviors, along with other factors, contribute to the high intake of calories and poorer diet quality seen in urban African American youth when compared to national samples⁵⁰. High obesity rates and poor diet quality in this population, combined with the known links between the social environment and weight status, underscore the importance of investigating the current social environment, to aid in the development of strategies to prevent obesity in urban, minority adolescents.

While cross-sectional quantitative studies assessing the impact of social influences' on weight-related behaviors have effectively demonstrated that relationships between the social environment and weight-related behaviors exist^{19,21,140,228}, they are unable to provide in-depth information to explain the mechanisms through which these relationships spread obesity among social contacts¹⁸. Researchers are beginning to seek additional information about these relationships using longitudinal assessment methods¹¹³, but additional research is needed. Qualitative data collection can enhance quantitative research strategies by providing in-depth information needed to aid in the interpretation of these findings. The few qualitative studies that have examined social influence in youth are limited in scope, focusing narrowly on parents¹²⁹ or friends²²⁹, and fail to provide a more complete picture of the diverse social environment of adolescents. In addition, only a small proportion of the qualitative studies focus on this important population^{203,204,229}. Mixed methods studies have not yet been used to assess the interactions between urban, minority adolescents and their social networks around eating and weight-related behaviors, and offer a unique opportunity to further explore this area.

The purpose of this study is to add to the current literature in two ways, first by providing in-depth information on the social roles and interaction between youth and their parents and friends, and secondly by exploring and expanding the knowledge base of youth's interactions with other social relationships. Researchers have a growing interest in intervening in the social environment, however they recognize that that modifying the social environment by outside parties (such as researchers) may be

difficult¹⁵⁵. This information may provide important insight that would aid in intervention design. The data collected aimed to answer the following research questions:

- What social relationships do youth identify as influencing eating and physical activity behaviors?
- What roles do different social relationships play related to youth's eating and physical activity behaviors? What type(s) of interactions do these individuals have with youth around food, nutrition, and physical activity?

Collecting this information will allow researchers and program staff to identify potential "change agents,"²³⁰ (i.e., influential individuals who could be engaged in obesity prevention interventions targeting low-income, urban, minority youth), as well as generate strategies to effectively harness social relationships in nutrition interventions.

5.3 METHODS

5.3.1 Study Design and Setting

This research is a sub-study of B'More Healthy Communities for Kids (BHCK), a multi-level obesity prevention intervention conducted in low-income, racial and ethnic minority, food desert neighborhoods on the East and West sides of Baltimore, Maryland^{28,231}. All participants were recruited from communities participating in the BHCK parent study, however, different groups of participants were recruited for the quantitative and qualitative data collection components.

The present study employed a convergent mixed methods design, which is characterized by collecting and analyzing the quantitative and qualitative data in

parallel, then merging the two strands for the interpretation and discussion of the results to enhance findings from both strategies (Figure 5.1)^{217,232}. The integration of quantitative and qualitative information has the potential to address gaps in the literature by allowing us to identify nuances in the data that would be lost if only one paradigm of data collection were used. In this study, the quantitative inquiry and analysis created a core framework for understanding influential social relationships, using structured surveys with youth (n=297). Through in-depth interviews with both youth (n=38) and their parents (n=10), the qualitative elements sought to provide in-depth information on how these interactions influence food and physical activity behaviors. Data were collected from June 2012 to June 2014. The Johns Hopkins Bloomberg School of Public Health IRB approved all of the study components.

5.3.2 Qualitative Data Collection and Analysis

Instrument Development. The instruments were developed by considering the goals of this research and by expanding upon previous work that has been done with this population^{176,203}. Separate qualitative instruments were developed for in-depth interviews with youth and parents. Interview guides used open-ended questions to elicit themes related to the current eating and activity-related behaviors of the youth, and the environmental, social, and household influences on the youths' health behavior. In-depth interview questions are listed in Table 5.1. During the data collection process, the interview guides were refined through an iterative process. The research team met regularly to discuss the information being collected and to add questions to expand upon emerging themes. Recruitment and data collection were conducted until the

information provided by additional interviews did not yield novel themes, indicating that saturation was reached²³³.

Participant Recruitment and Selection. Eligibility criteria for in-depth interviews required participants to be between the ages of 9 to 15, living in one of the predominately African American, low-income neighborhoods participating in the BHCK intervention, or regularly attending a recreation centers participating in the BHCK intervention. Participants were recruited at community locations (recreation centers, small retail food stores, etc.) with the support of community collaborators (recreation center directors, store owners). If an individual agreed to participate, contact information for the youth and parent were collected, and eligibility was confirmed with the parent over the phone, in-person, or with the support of a community collaborator. Purposive maximum variation sampling was used to obtain information from youth with a mix of genders, ages (within the 9-15 range), and neighborhood locations (East vs. West Baltimore).

A sub-sample of youth participants' parents were also recruited and interviewed, in efforts to gain parental insight and to enhance source triangulation. For nine of the 10 youth-parent dyads, both the parent and youth were interviewed; one youth participant in this sub-sample declined to participate after her parent was interviewed. Parental consent or parental consent and child assent were collected prior to the data collection with parents or youth, respectively.

Qualitative Data Collection. Study team members trained in qualitative research methods (EAS, KAJ, SLP) conducted the in-depth interviews. A total of 48 respondents

were interviewed. Youth interviews (n=38) lasted 25-55 minutes, and parent interviews (n=10) lasted 20-75 minutes. Youth and adult interviews were conducted separately. Twelve of the 38 youth respondents were interviewed in pairs with other youth to facilitate the comfort and openness of younger respondents. Participants received a \$20 gift card upon completion of the interview.

All interviews were audio recorded and transcribed verbatim to preserve the emic terminology used by the youth and parent participants. Interviews were transcribed immediately following the interview, in most cases by the interviewer. Transcripts were uploaded to the Atlas.ti software version 7 (Atlas.ti Scientific Software, Berlin, Germany) for data management and analysis.

Qualitative Data Analysis. Qualitative data analysis was guided by the principles of directed content analysis as described by Hsieh & Shannon²¹⁸. Interviewers (EAS, KAJ, SLP) reviewed the transcripts and generated an initial list of emerging themes. These themes, as well as several *a priori* codes of constructs from Social Cognitive Theory¹²⁵, Social Ecological Theory¹²⁴ and specific research questions, were used to develop a codebook that was iteratively modified and used throughout the coding process. A total of 32 codes were developed and grouped into categories such as family relationships, peer relationships, and physical activity. Two initial transcripts were double-coded by coders (EAS and KAJ), discrepancies in code usage between coders were resolved, and the codebook was clarified accordingly. After the initial double-coding and codebook development, transcripts were coded individually. Researchers met routinely to ensure codes were applied consistently and discuss emerging themes. After all transcripts were coded, one researcher (EAS)

reviewed all transcripts to assure consistency and to add new themes that emerged throughout the coding process.

5.3.3 Quantitative Data Collection and Analysis

Instrument Development. The quantitative measures collected demographic information and used a seven-item Change Agent questionnaire published in the literature²⁰⁸. This questionnaire was adapted for use in the BHCK study, with the purpose of assessing social roles and interactions to determine whom youth perceive as being supporters of helping the youth change their eating and physical activity behaviors²⁰⁸. The seven questions asked youth if they had anyone in their life that performs selected supportive roles related to healthy eating and physical activity. For each affirmative response, youth were then asked to identify all of the people in their lives who play that role. Response categories included: parents, grandparents, siblings, other family members, friends, mentors, teachers, doctors, and other. The response categories, 'mentor' and 'other' experienced very low response rates (less than 5.7% and 2.3% for any question, respectively), and were dropped from the analyses.

Participant Recruitment and Selection. Again, youth between the ages of 9 to 15 living in neighborhoods participating in the BHCK intervention were eligible for the quantitative surveys. The quantitative data collection participants were sampled using randomized sampling frames created from recruitment lists for each neighborhood; the details of the randomization process can be found elsewhere²⁸.

Quantitative Data Collection & Analysis. Demographic data and the Change Agent questionnaire were collected during in-person interviews by public health

graduate students or study staff who were trained and certified by the Principal Investigator (JG). Youth were provided a \$30 gift card for participation. Data were collected from a total of 297 youth (157 females, 140 males). Descriptive statistics, including the proportion of youth who reported receiving support for changing health behaviors, for each type of relationship (parent, grandparent, sibling, etc.) and overall were evaluated. Wald post-estimation tests were used to determine differences in the proportions for each of the seven Change Agent questions. Statistical analyses were performed using Stata version 13.1 (StataCorp LP, College Station, TX).

5.3.4 Mixed Methods Data Interpretation

In convergent parallel mixed methods studies, the qualitative and quantitative strands of data are merged at the interpretation phase (Figure 5.1). To do this, the research team used the stated research questions to guide interpretation of the results, by first exploring the results of each strand of data collection, then synthesizing a combined interpretation by layering the data collected from the different strands in addition to considering information provided by convergence of both strands and exploring areas of dissonance between the strands²¹⁷. Methodological, source, and investigator forms of triangulation were employed to increase the credibility of the interpretation^{219,220}.

5.4 RESULTS

5.4.1 Demographics

The quantitative sample of youth (n=297) was 53% female, 91% African American, mean age 12.3±1.5 years, from low-income households (68% from

households with incomes <\$30,000/year). The qualitative sample of youth (n=38) was 42% female, and 97% African American, mean age 11.4±1.5 years. The qualitative sample of parents (n=10) was 80% female, and 100% African American.

5.4.2 Social Relationships that Influence Youth's Eating and Activity

Parents, grandparents, friends, siblings, other family members, teachers, and doctors/nurses were the main individuals identified by youth as interacting with them around nutrition and physical activity. Parents, followed by grandparents, were identified most frequently and consistently in both the quantitative questionnaires and qualitative interviews.

5.4.3 Roles and Interactions of Social Relationships around Nutrition and Physical Activity

A high proportion (74%-89%) of youth reported that they had someone in their life that provides support for changing health behaviors (Table 5.2). Youth and parents elaborated on this by providing descriptive narratives of social interactions related to food and physical activity. Figure 5.2 integrates and synthesizes the results into a conceptual framework to aid in understanding the roles and social interactions between youth and their social contacts.

Parents' Roles and Interactions. Parents provided the most support for healthier behaviors, and provided that support through creating health-promoting rules, managing the home food environment, and serving as a role model for physical activity in youth.

Parents were reported as being supportive of health behavior change, by significantly more youth than any other relationship for the majority (6 of 7) of the questions in the Change Agent questionnaire. For each question on the Change Agent questionnaire, parents were reported as performing that role by 30%-64% of youth. The majority of youth discussed parents as providing broad support for healthier eating habits and promoting physical activity. A 12-year-old male said, "Man, my father he always talkin'; talkin' to my mother and then talkin' to us about like keeping your body healthy and stuff...in my house we eat vegetables a lot."

A few youth described parents as being apathetic or unsupportive of healthier lifestyles. For example a 13-year-old female reported, "sometimes I don't want to eat a lot of junk food like my mother, so I just go ahead and eat healthy," indicating both a lack of parental role modeling and interest in promotion of healthier behaviors.

Parents described the ways they promote healthy eating and physical activity among their children. For example, several parents discussed creating "rules" such as reducing juice consumption by drinking water between glasses of juice, having a vegetable with every dinner meal, and limiting screen time. An 11-year-old male reported "I actually don't watch TV or play video games during the week, my mom doesn't allow me." The father of a 10-year-old female reported a household rule that his daughters had to finish their vegetables at family meals, but also eluded to the fact that the rule may be loosely enforced, "her mother tries to make her eat [*greens*], but then I'll try to come to the rescue when she's picking at 'em."

Parents also discussed ways in which they purchased food for the household as a method for influencing their child's eating habits. The mother of an 11-year-old male described a strategy for getting her kids to eat fewer sugary snacks by saying, "I just don't buy it, and if I don't buy it, how they gonna get it?" However, parents desire for creating a healthy home food environment was tempered by the cost of grocery items and lack of information regarding the healthfulness of certain items. The mother of an 11-year-old-male described her household food purchasing behaviors by saying "I don't buy candy too much, I let them have candy like at holiday time, just for the holidays" but this mom then goes on to say "I buy them Hawaiian Punch because it's always two for \$5 for the gallon. I'm not sure if it's good or bad for 'em, but the price, you get a lot of juice for \$5," showing that perceptions of healthy and unhealthy items along with price can influence the home food environment.

Youth occasionally discussed doing physical activity with their parents; however, youth—predominately males—more frequently discussed parents' past athletic accomplishments as being influential on their pursuit of physical activity. For example, a 12 year-old-male describes his father's sports career as an inspiration for his own dedication to athletics by saying, "he started playing when he was my age, at 12, it took him a year to get better at the sport, he'd wake up early in the morning and go to the basketball court and start practicing, so he had a work ethic." Another 12 year-old-male explains his father's football and basketball experience, saying "he always strive to get better at things...he didn't want nobody to tell him he did a good job or nothing, and um, if he was doing, if he did bad or if he sucked at the [game], he wanted to get better

than everybody else.” These quotes indicate that parents’ past athletic experiences encourage pursuit of physical activity, potentially more than their current modeling of physical activity behaviors.

Grandparents’ Roles and Interactions. After parents, grandparents—particularly grandmothers—were the most often described as playing a role in supporting youth’s eating behaviors by sharing nutrition advice, health information, and teaching cooking skills to both parents and youth. Grandparents were reported as having little involvement in supporting physical activity.

Second to parents, grandparents were reported significantly more than any other relation in terms of supporting health behavior change for five out of the seven questions. Thirteen to 26% of youth reported grandparents performing the social roles identified in the Change Agent questionnaire. In fact, both youth and parents described receiving advice from grandmothers about eating, particularly related to the type of foods that were appropriate for youth to consume, this created an intergenerational expectation for nutrition and health information to be passed down, especially from grandmothers, to parents, to children. A 10-year-old female went on to explain this intergenerational involvement by saying “I think it is important to eat healthy because once I grow up I’ll give advice to my kids and they’ll tell their kids and it goes on and on.”

Youth and parents also described grandmothers as having an important role in teaching them to prepare both healthier (broccoli, greens) and less healthy foods (fried chicken and fish, red velvet cake). The mother of an 11-year-old-boy explains a family tradition of passing down cooking skills saying “my grandmother kept [my mother] and

her sisters in the kitchen, and I was the only girl with my mom. My grandmother would cook every Sunday. I used to sit there, once I got older they used to have me startin' with opening up cans and stuff like that."

Friends' Roles and Interactions. Friends had smaller and more specific roles related to food and physical activity behaviors compared to other social relationships. Specifically, friends were identified as engaging in physical activity with youth, purchasing and sharing food with youth, and potentially influencing what foods youth select in social settings.

A significantly higher proportion of youth (42%) reported that their friends would be their 'partner' in making positive food and physical activity changes together, compared to any other relationship (the next highest response was 30% of youth reporting parents would play this role, $p=0.01$). Outside of being a 'partner', less than 11% of youth reported that their friends performed other supportive roles.

The narratives provided by youth describe situations in which friends frequently perform food and physical activity related behaviors together. Related to physical activity, youth reported regularly participating on youth sports teams or in active clubs at school or recreation centers and playing outside with their friends in their neighborhood. An 11-year old-boy described spending time with friends in his neighborhood by saying, "we'll play dodge ball, we play hop scotch, we'll play basketball, football. We just play a lot of games. It be fun." Parents also shared the perception that physical activity was something youth did with their friends, the mother of a 10-year-old girl explains her daughter's sedentary behavior by saying, "she's not

active because she don't really have no friends."

Both boys and girls described getting and sharing food while with their friends; but most of what was described would be considered less healthy items (chips, cookies, candy, soda, sweetened fruit drinks). A 14-year-old girl described getting food with friends by saying, "Everyone before first period class, they always go to 7-11. It be so crowded there." Accordingly, parents also acknowledged that the eating and sharing of foods between friends is commonplace. The mother of a 10-year-old boy said that sharing food is part of the culture in her neighborhood explaining that, "there's things we do in our neighborhood...sometimes the parents come out, like I do, and give the kids popsicles and stuff like that, or if [the kids] friends have candy in the house they share with them."

When youth describe the influence of their peers on their eating choices, boys and younger girls (less than 12 years old) described feeling like their friends influenced their eating habits very little, as stated by a 11-year-old male saying, "basically if you ask me, everybody eats the way they like to eat." However, older girls described friends as having some influence on their choices; for example a 12-year-old girl stated, "[if others are eating something] and they're like popular, I want to eat it because I don't want to be, like, I don't want to be the person who stands out, out of all them." Parents also acknowledge the influence that their friends have on food choices. The father of a 10-year-old girl shared "they see their friends eating like chicken fingers or something like that and it makes them wanna eat it. You know, 'cuz if they taste what they friends taste they, want that stuff all the time." It is important to note that this influence may

be limited to occasions when youth are in the presence of their peers; for example, a 15-year-old boy stated “If I’m with my friends or something, I eat out, but if I’m home I eat in the house.”

Both youth and parents identified that friends serve as ‘partners’ for engaging in physical activity, but that the nutrition-related activities that youth and their friends participate in together do not consistently support healthier food consumption as indicated by the quantitative results. Youth’s descriptions of their friends may indicate that friends tend to promote less healthy food consumption.

Siblings’ Roles and Interactions. Similar to friends, youth identified siblings as having limited roles in promoting health behaviors. Youth identified siblings as primarily being ‘partners’ in food and activity related behaviors, whereas, parents described behavioral mimicry occurring among younger siblings.

Siblings were reported by a smaller percentage of youth respondents as being supportive of health behavior change compared to many other relationships. However, a higher percentage of youth (17%) reported that siblings were willing to be a ‘partner’ in making food and activity changes together, compared to providing other forms of support. One way youth described ‘partnering’ with their siblings was in food preparation, particularly preparing snacks and meals at home with their siblings when the main food preparer or caregiver was not available (i.e., after school). For example, a 14-year-old girl reported, “usually it just be me and my sister ‘cause we’ll cook, we’ll bake like hot wings in the oven.” Parents identified that younger siblings mimic older siblings choices. For example, a mother of an 11-year-old boy reported that, “[the

participant's son's] little brother will follow behind him, so whatever he eat, his little brother wanna eat."

Other Family Members' Roles and Interactions. Other family members, particularly aunts and cousins, provided some limited support for health behavior change. Aunts encouraged youth to try novel foods, while cousins served as playmates in both active and sedentary activities.

A small percentage of youth (8-13%) reported other family members as playing a supportive role in health behavior change. In the qualitative narratives, both parents and youth described situations where youth eat with other family members on a regular basis, and how eating with others created opportunities to try new foods. The mother of a 10-year-old girl highlights this by saying, "my daughter came home [from a relative's house] eating hot sauce. She came home eating pig's feet. I don't eat pig's feet. Some other stuff...chitterlings. I don't eat chitterlings, I know she done picked that up from somewhere else." An 11-year-old boy shared a negative experience of trying new foods saying, "I was over at my aunt's house and, you know, sometimes she has food I've never ate before. So she said: '*try this, you might like it. It's very good.*' ... so I taste it. I tell her it's good. And as soon as she walk away I just had to spit it out."

Youth often described visiting cousins on the weekend or during the summer and participating in sedentary (TV, video games) or active behaviors together. An 11-year-old male described "me and my cousin play Wii Fit, Wii Sports. We play Mario. Mario, yeah, is fun. Them days is fun."

Professionals' Roles and Interactions. Professional relationships in the context of this manuscript refer to health care providers and teachers, both of whom were identified by youth as primarily providing information about healthy eating and physical activity, but doing little else in terms of interaction around eating and physical activity. For example, 20% and 21% of youth reported teachers and doctors talking to them about making improvements, but only 5% and 4% of youth reported that their teachers and doctors, respectively, would be partners in making changes. Youth and parents both described situations where doctors provided nutrition or physical activity information to the youth, mostly related to weight status. A 10-year-old girl stated that the doctor, “said I was a little overweight for my age, and he gave me forms about what I should eat and what I shouldn’t, and bologna was one of the things on the list.”

In addition to direct conversations with their doctors, youth often reported secondhand health information from doctors being passed down through other family members. A 10-year-old male said he knew drinking water was important because “my grandmother used to have kidney problems and her doctor told her ‘*drink more water, it’s gonna cleanse your system*’. My grandmother told my mother and my mother told me.”

Youth expressed that health information and physical activity opportunities were shared through school-related programming (such as school-based sports teams, field trips to farms, school gardens, etc.), more so than directly from teachers.

5.5 DISCUSSION

This study used a convergent parallel mixed methods design to explore the interactions and roles that different social relationships had on nutrition and physical activity-related health behaviors in low-income, predominately African American youth in Baltimore City. Combining quantitative and qualitative research paradigms provided complementary, in-depth data on this complex and understudied issue that can be used to enhance the design of interventions targeting the social environment for urban, racial and ethnic minority adolescents. The current literature primarily focuses on the roles of parents and friends, and has identified that the eating and activity patterns of youth are related to those of their parents and their friends^{15–17,114}. Some studies indicate that parents' behaviors (more so than friends' behaviors) are closely related to youths' eating behaviors¹⁵. One recent study examined both parents and friends and found that the two groups provide different types of social support to youth related to weight and health-related behaviors²²⁹.

In this study youth reported that parents, grandparents, friends, siblings, other family members, teachers, and health care providers interact with youth related to nutrition and physical activity behaviors through semi-distinct roles, which is consistent with Koehly and colleague's conceptualization of youth's social network²³⁴.

Consistent with previous studies^{15,16,110,203,204,229,235}, this study identified parents as playing the most significant role in promoting healthy eating and physical activity habits among youth; with grandparents (particularly grandmothers) also identified as having an important role. Youth reported that parents and grandparents played

multiple roles in influencing their eating and physical activity behaviors, including sharing knowledge about nutrition and physical activity, managing the home food environment, teaching food preparation methods, serving as physical activity role models, and setting rules and expectations for health behaviors.

Similar to other studies^{17,114,203,229,235}, friends were perceived as individuals with whom youth actually engage in health-related behaviors (i.e., participate in active play, purchase and share food). Our results indicated that friends promoted healthy physical activity behaviors by being willing to be active with youth. The food-related behaviors that friends influenced tended to involve purchasing, sharing, and consumption of less healthy foods rather than promoting healthier food choices. This potentially indicates that the 42% of youth who reported their friends would serve as partners in making changes were more focused on physical activity behaviors, rather than eating behaviors, because the youths' and parents' narrative descriptions most often referenced less healthy food options and behaviors when talking about friends.

To our knowledge, this is one of the first studies that delves into the roles of social relationships beyond immediate family and friends on youths' eating and physical activity behaviors. Our findings show that other family members like aunts provided exposure to novel foods, and cousins participated in both physical activity and sedentary behavior with youth. Youth identified that school programs and healthcare providers mainly provided information about health-related behaviors, but it is unknown whether or not the information provided influenced behavior. Overall friends, other family

members, teachers and health care providers had specific, but limited roles and interactions around youths' eating and physical activity behaviors.

Given the known relationships between social relationships and obesity²³⁴, researchers should consider these factors when designing interventions to prevent and treat obesity in urban, racial and ethnic minority adolescents. Specifically, future research is needed to test the effectiveness of intervention strategies that enhance or expand the supportive roles played by social network members. Examples of intervention strategies that would enhance current roles could include things such as providing parents with tools to assess and modify the healthfulness of their home food environment; creating multi-generational (grandmother, parent, youth) healthy cooking classes; or partnering peers together to increase physical activity in school or recreation center settings (this strategy is particularly encouraging because of favorable results seen in recent studies¹⁸⁵).

Obesity is a multi-faceted problem and researchers have begun to address it through systems-oriented interventions with multi-level, multi-component intervention strategies¹⁵⁷. Large intervention trials such as Shape Up Somerville²³⁶, and B'More Healthy Communities for Kids²⁸ use multi-component interventions to address the physical environment, but given the many social agents who interact and potentially influence youth nutrition and physical activity behaviors, there may be value in investigating multi-component social environment intervention strategies within these large interventions, to enhance and sustain results.

The credibility of the findings presented in this study are enhanced by a strong design, a large sample size, and the use of multiple methods, which allows for methodological triangulation^{219,220}. Participant triangulation was employed in this study by collecting interview data from both youth and their parents. Multiple researchers were involved in the design, data collection, analysis, and interpretation of this study, allowing for investigator triangulation. Study limitations must be acknowledged. In this study we were not able to assess whom the youth identified as their primary caregivers (i.e., are they being cared for by their parents or someone else?), which may have influenced youth's perceptions of the normative roles that different relationships play. There is also the potential for selection bias as a result of the selection strategy used to obtain the qualitative data. While participants were purposively sampled to participate in the qualitative interviews, they were not selected at random. Parents' and youths' who agreed to participate may be more interested in nutrition, physical activity, and overall health than parents and youth who declined interviews. Finally, this research was conducted with a specific population (low-income, urban, predominately African American youth from Baltimore, MD). While this is an important population due to their nutrition- and obesity-related health disparities, the results may have limited transferability to other settings or groups. Despite these limitations, the findings provide novel and valuable information related to the roles and social interactions that influence the eating and physical activity behaviors of low-income, urban, predominately African American youth.

5.5.1 Implications for Future Research and Practice

These data suggest that there are multiple social relationships that influence youths nutrition and physical activity behaviors. When designing interventions aimed to create impact in the social environment, researchers and practitioners should consider the unique roles and interactions that different relationships have in supporting weight-related health behavior change for youth. Future research should consider strategies that address multiple levels of the social environment as well as other factors such as the built environment, to fully conceptualize the systems in which obesity-related behaviors operate.

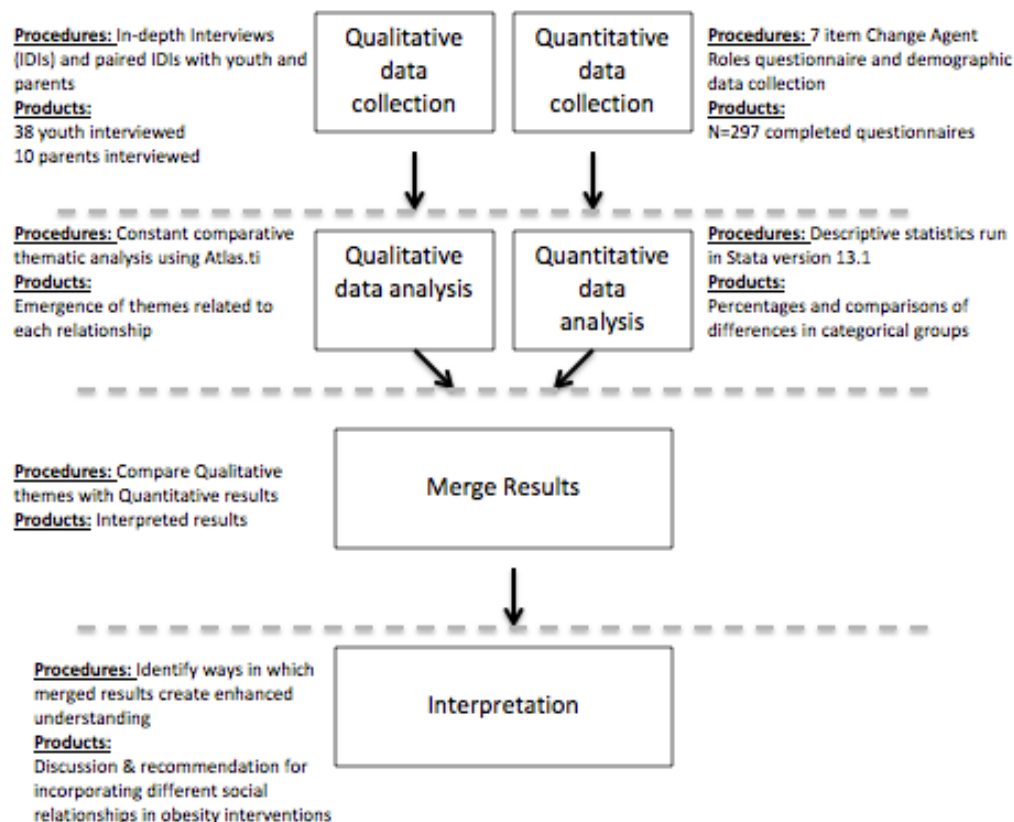


Figure 5.1: Convergent Parallel Mixed Methods Design Used to Examine the Roles that Social Relationships Play in Promotion of Eating and Physical Activity Behavior Changes among Low-income, Urban, Minority Adolescents
Adapted from: Creswell & Plano Clark, 2011

Table 5.1 In-depth Interview Questions Related to Social Influences on Youth's Eating and Activity Behaviors, for Youth and Parent interviews

Youth in-depth interview questions

- Could you take me through your typical day and explain it?
 - What do you like to do in your free time?
 - Please tell me a little about your family and the neighborhood you live in.
 - Do you attend a recreation center? What do you do when you go there?
 - Tell me about all of the places you got food in the last week or so.
 - Could you tell me more about how your family eats and buys food?
 - Tell me a little bit about the types of foods that your friends eat and foods that they buy when you are together.
 - If you had to ask someone for advice, whom would you ask? Why would you ask that person?
 - Tell me about times when you have made a change. What might make you or help you change the way you eat in the future?
 - If you had to encourage other kids your same age to eat healthier and be more active, how would you do that?
-

Parent in-depth interview questions

- Can you tell me a little about the people who usually stay with you?
 - Let's talk more about [name of child]. Can you describe for me in more detail what she/he does on a typical day?
 - When I say the word "healthy" what does that mean to you?
 - Does [child's name] ever prepare his or her own food?
 - Does [child's name] ever buy his or her own food?
 - Does your child attend a recreation center? How does your child spend his/her time there?
 - Is there anyone who your child looks up to or seeks advice from?
 - Could you talk about the kind of information that you consider when purchasing food?
 - We're developing some ideas to promote eating healthier and being more active in this community. Do you have any ideas that might help us?
-

Table 5.2: Types of Support Provided by Change Agents for Modifying Eating and Activity Behaviors Among Urban, Minority Youth (total n=297)

Do you have someone in your life who:	All Relation- ships	Relationship						
		Parent	Grand- parent	Sibling	Other Family	Friend	Teacher	Doctor/ Nurse
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Question 1. Talks to you about making improvements in your food and physical activity habits?	254(86%)	190(64%) ^a	77(26%) ^b	39(13%) ^c	38(13%) ^c	31(10%) ^c	58(20%) ^b	61(21%) ^b
Question 2. Encourages you to keep making healthy choices even when you don't feel like it?	264(89%)	187(63%) ^a	75(25%) ^b	33(11%) ^c	34(11%) ^c	29(10%) ^c	40(13%) ^c	40(13%) ^c
Question 3. Show you how to make healthy choices by setting a good example?	262(88%)	159(54%) ^a	72(24%) ^b	42(14%) ^{cd}	28(9%) ^{cde}	20(7%) ^{de}	38(13%) ^{cd}	35(12%) ^{cd}
Question 4. Praises you about making changes in your diet and physical activity habits?	234(79%)	146(49%) ^a	67(23%) ^b	29(10%) ^{cde}	28(9%) ^{cde}	18(6%) ^{de}	38(13%) ^{cd}	34(11%) ^{cd}
Question 5. Will be your buddy or partner in making food and physical activity changes together?	262(88%)	88(30%) ^a	39(13%) ^{bcd}	50(17%) ^{bc}	30(10%) ^{bd}	124(42%) ^e	16(5%) ^f	12(4%) ^f
Question 6. Helps you solves problems that get in the way of eating healthy and being active?	219(74%)	145(49%) ^a	52(18%) ^b	30(10%) ^c	24(8%) ^c	34(11%) ^c	27(9%) ^c	24(8%) ^c
Question 7. Tells you about new healthy foods and encourages you to try new healthy foods?	246(83%)	136(46%) ^a	68(23%) ^b	28(9%) ^c	36(12%) ^c	30(10%) ^c	32(11%) ^c	32(11%) ^c

Different Superscripts represent statistically significant differences in percentages at the $\alpha \leq 0.05$ level

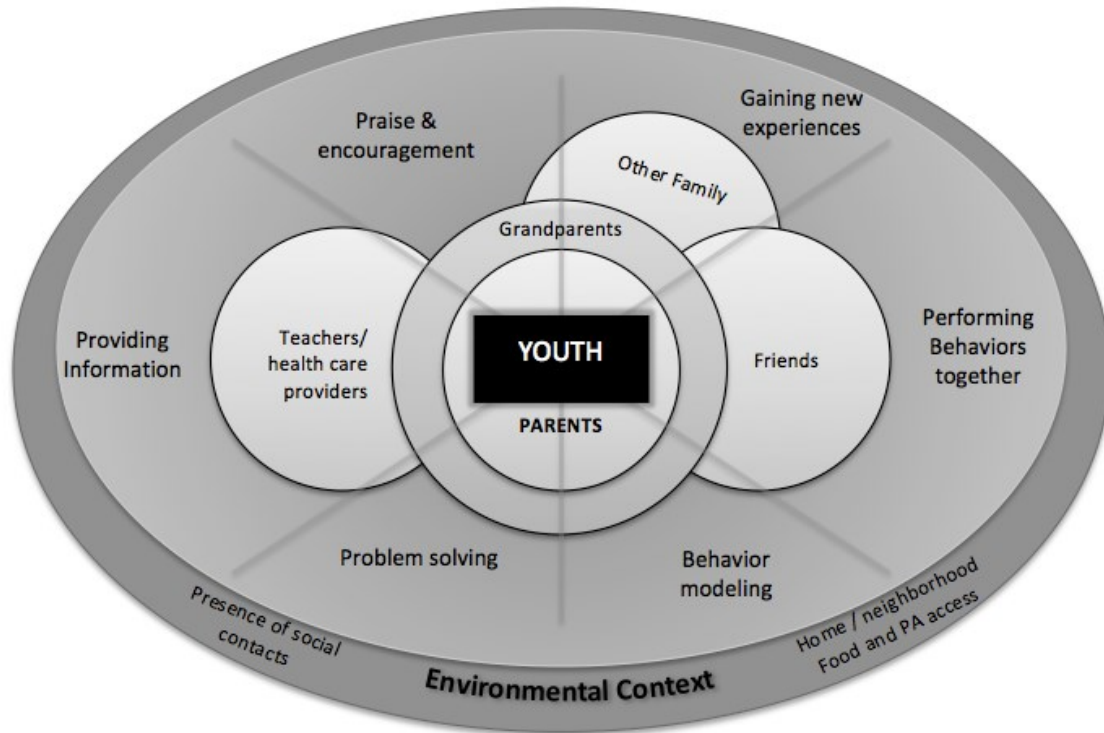


Figure 5.2: Conceptual Framework depicts Influence of Social Contacts on Youth's Eating and Activity Behaviors

**CHAPTER 6. EVALUATION OF A YOUTH-LED INTERVENTION FOR CHILD OBESITY
PREVENTION AMONG URBAN, AFRICAN-AMERICAN YOUTH: PERCEPTIONS AND
IMPACT AMONG YOUTH-LEADERS (PAPER 3)**

6.1 ABSTRACT

Youth-led interventions have the potential to create two forms of impact: on youth-participants receiving the intervention, and on youth-leaders delivering it. This study comprehensively evaluates the impact of a youth-led intervention on 16 Baltimore-based college students (youth-leaders), by using in-depth interviews and structured questionnaires to assess their perceptions of the study impact, and changes over time in their dietary intake, nutrition-related psychosocial factors, and leadership skills, compared to age-matched youth who were not youth-leaders (n=10). In-depth interview themes revealed that youth-leaders perceived that the intervention impacted themselves, as well as youth-participants, and the social networks of both groups. Difference-in-differences analyses assessed changes in quantitative survey results over time, and found that youth-leaders experienced greater increases in behavioral intentions to eat healthfully versus the comparison group ($\beta=2.7$, Robust Standard Error=1.2, $p=0.03$), and perceived significant decreases in support for healthy eating from their friends, compared to the comparison group ($\beta=-3.2$, Robust Standard Error=1.4, $p=0.03$). These results show that youth-leaders perceived multiple levels of impact of the intervention, and that interventions may improve intentions for healthier eating among youth-leaders. Additional youth-led interventions are needed to build evidence of the dual impact these interventions can potentially create.

6.2 INTRODUCTION

Childhood and adolescent overweight and obesity rates in the United States have increased rapidly over the past three decades². Although there is evidence that the rates have plateaued in recent years^{2,3} and declined in some sub-groups⁵, rates are still alarmingly high, and disproportionately affect low-socioeconomic status and minority youth^{6,7}. While progress has been made toward identifying promising strategies to reverse obesity trends²³⁷, continued efforts are needed, particularly for low-income African American youth.

Recognizing the strong influence of social relationships on adolescent behavior, health disciplines have incorporated youth into intervention teams to serve as leaders to champion changing related to health issues such as HIV, eating disorders, asthma, and smoking^{166,167,169,238}. To date, there have been a limited number of youth-led nutrition and obesity prevention programs published in the literature^{171,172,174,175,184,185,187,191}. While these studies varied widely in their implementation, many show promising results, including increased sales of healthier options in school cafeterias^{170,187}, decreased sugar-sweetened beverage consumption^{171,184}, improvements in obesity-related psychosocial outcomes such as knowledge, attitudes, self-efficacy, and perceived social support^{172–174,180,182,189}, reduced intake of snacks and desserts¹⁷⁵, and improvement in anthropometric measures^{173,175,177–180}.

These initial successes indicate that nutrition-related health improvements can result from youth-led programs. However, further research is needed to truly understand the utility of incorporating youth-leaders in obesity-prevention programs. A

key gap in this literature is to examine the impact of programs on the youth-leaders themselves. The literature indicates that youth-leaders may receive the largest impact of the intervention because they receive the highest dose¹⁹⁰. However, among the nutrition-related youth-leader literature, many studies fail to report any outcomes concerning the youth-leaders^{171–173,176,184}. In studies where youth-leaders are evaluated, they are often assessed using the same metrics as the general study population, which fails to capture factors specific to youth-leaders' unique perceptions of the intervention and their role in intervention design or delivery^{177–179,183,191}. Of the few studies which have collected measures to understand the impact of the intervention on youth-leaders^{170,175,181,190,192}, none have comprehensively evaluated the intervention using multiple research methods to obtain important information such as youth-leader characteristics, their perceptions of the intervention impact, and the impact of the intervention on the youth-leaders.

The B'More Healthy Communities for Kids (BHCK) study provides a novel opportunity to assess the youth-leader role. BHCK is a multi-component systems-oriented, obesity prevention intervention that intervenes at the policy, retail food (wholesaler, corner store, carry-out), youth-leader, and caregiver levels, focused on improving the nutritional health of low-income, urban, African-American youth ages 10–14²⁸. Within the BHCK study, a cohort of Baltimore-based racial and ethnic minority college students were recruited, selected and trained as youth-leaders, with the purpose of delivering an interactive nutrition intervention to younger youth.

The purpose of this paper is to assess the BHCK youth-leader cohort to understand their perspective on the impact of the youth-led intervention components through qualitative narratives of their experiences and a quantitative evaluation of the impact of their involvement in the intervention. The following research questions were addressed:

- What are the characteristics of youth who participated as youth-leaders? Were they able to implement the intervention?
- What were youth-leaders' perceptions of the BHCK intervention and its impact on themselves and the intervention participants?
- Did participation in the youth-leader program improve psychosocial factors, dietary intake, and leadership characteristics of youth-leaders compared to a comparison group?

6.3 METHODS

6.3.1 B'More Healthy Communities for Kids Study

The BHCK trial is a systems-oriented, childhood obesity prevention intervention, with the goal of promoting healthier food choices and preventing obesity among 10 to 14 year-old youth, by creating synergistic intervention strategies at multiple levels of the food system. The BHCK trial uses a group-randomized study design, where 14 low-income geographic zones surrounding recreation centers serve as either intervention (n=7) or comparison (n=7) areas. Eligibility criteria required all participating areas to be predominantly low-income and African-American food desert neighborhoods. A detailed description of the BHCK trial can be found elsewhere²⁸.

6.3.2 BHCK Youth-leader Intervention

The youth-leader level of the BHCK intervention involved recruiting, training, and evaluating 16 Baltimore-based college students whose primary role was to deliver a 14-session interactive nutrition curriculum to younger youth in the seven intervention recreation centers. Additional roles of the youth-leaders included supplementing the retail food outlet intervention by working with BHCK staff to deliver in-store interactive sessions, generating Facebook and Instagram content for BHCK's social media intervention, and serving as 'spokespeople' for the intervention in videos, posters and handouts. The interactive recreation center curriculum delivered by the youth-leaders was developed in partnership with a community-based, youth-led organization that specializes in promotion of social issues through art and education. All of the 14 sessions, each one hour long, involved an icebreaker activity, a brief educational component, and taste test of a healthier food/beverage item. The bulk of time was spent on experiential learning such as interactive games and cooking classes (see Table 3.2 for more information). The curriculum focused on four content areas that aligned with other BHCK intervention levels: healthy beverages, smart snacks, better breakfasts, and healthy cooking. All sessions were designed to be delivered by three to six youth-leaders, but were adaptable for larger or smaller groups, as needed.

Youth-leaders were recruited through informational flyers sent to academic institutions (high schools, colleges, and GED programs). A total of 135 applications were received, 41 candidates were interviewed, and 16 were selected to be youth-leaders. All youth-leaders completed an intensive 12 session (27 hour) training program, that

used experiential learning strategies to promote team-building, leadership and communication skills development, along with intensive intervention delivery practice and feedback. Details of the training are described elsewhere²³⁹. Youth-leaders worked in one to three different recreation centers, depending on their schedule. Youth-leaders were paid \$10 an hour for an average of three hours per week.

6.3.3 Assessment of Youth-leader Characteristics and Description of Intervention Implementation

Youth-leader characteristics were collected as part of the baseline and post-intervention surveys. Descriptive measures of the youth-leader intervention implementation were collected and monitored by BHCK staff who provided oversight to the recreation center sessions. Information collected included: number of recreation center sessions delivered by the youth-leaders; the number of youth that the youth-leaders interacted with at each recreation center session; and youth-leader retention rate. Additional implementation evaluation measures (reach, dose, fidelity) of the BHCK youth-leader intervention are being published elsewhere²¹⁵.

6.3.4 Assessment of Youth-leader Perceptions of Intervention Impact

Data Collection. A BHCK staff member (EAS) who has received extensive training from the BHCK Principal Investigator (JG) on qualitative research methods conducted in-depth interviews with each of the 16 youth-leaders at the midpoint of the intervention. The timing for these interviews was selected because it allowed the youth-leaders enough time to experience, and master some of the skills necessary to deliver the

intervention, yet still identify initial and on-going challenges associated with intervention delivery.

An in-depth interview guide developed for youth-leaders working with low-income, urban youth¹⁹² was adapted for the purposes of this study. The interview questions focused on background information on the youth-leaders, the impact of the BHCK program on youth-leaders and participants, and feedback on the BHCK intervention (Table 6.1). Interviews lasted 45 to 95 minutes, and youth-leaders received a \$20 gift card after completing the interview. Interviews were audio-recorded and transcribed verbatim by the interviewer or BHCK study team members to preserve the emic terminology used by the youth-leaders. Transcript validation was not pursued here, however, due to the on-going relationships with youth-leaders, clarification of themes was able to occur during future contacts. ATLAS.ti software version 7 (ATLAS.ti Scientific Software Development GmbH, Berlin, Germany) was used for transcript management and data analysis. All components of the BHCK intervention were approved by the Johns Hopkins Bloomberg School of Public Health IRB. Informed consent and parental consent for participants under the age of 18 were obtained.

Data Analysis. Qualitative data analysis was guided by the principles of *directed content analysis* as described by Hsieh & Shannon²¹⁸. Coders (EAS, MJMR, and CS) reviewed the transcripts and generated an initial list of significant themes. These themes, as well as several *a priori* codes of constructs from relevant behavioral theories (Social Learning Theory¹²⁵, Social Ecological Theory¹²⁴, Diffusion of Innovations²²²) and specific research questions, were used to develop a codebook that was iteratively

modified and used throughout the coding process. A total of 56 codes were developed and grouped into categories, for example: relationships between youth-leaders and participants, and intervention impact on youth-participants and youth-leaders. All coders coded two initial transcripts to identify and resolve discrepancies in code usage, and to refine the codebook. After the initial double-coding, transcripts were coded individually. Researchers met routinely to ensure codes were applied consistently, and to discuss emerging themes. After transcripts were coded, one researcher (EAS) reviewed all transcripts to assure consistency and to add new themes that emerged throughout the coding process.

6.3.5 Assessment of Intervention Impact on Youth-leader Psychosocial Factors, Dietary Intake, and Leadership Skills

Data Collection. The impact of the intervention was quantitatively assessed on the youth-leaders (n=16) and a cohort of comparison youth-leaders (n=10) who applied for the youth-leader position but were not selected for reasons such as schedule conflicts and not meeting the age criteria. Measures included a 129-item youth-leader impact questionnaire (YIQ), modified from the literature^{150,168,240,241}, and the Block 2004 Kids Food Frequency Questionnaire (FFQ)²⁰⁹. The YIQ assessed psychosocial factors related to healthy eating (behavioral intentions, outcome expectations, self-efficacy, social support), leadership skills, and anthropometrics (see Table 3.4 for details). Dietary intake data was collected on the FFQ. The YIQ and FFQ were administered at baseline and post-intervention (10-months). Participants received a \$30 gift card after completing the 60-90 quantitative minute interviews.

Data Management and Analysis. Upon completion of the interviews, responses were cleaned and entered into databases. One comparison youth did not provide post-intervention data, and was dropped from the analyses, otherwise all data was complete. To address the non-random assignment of youth-leaders, difference-in-differences analyses were used to assess changes in the groups over time. Difference-in-differences analyses reduce the effect of selection bias by comparing the average change over time in the intervention and comparison groups and avoids over-estimation of significance levels²²¹. All analyses were conducted in Stata version 13.1 (Stata Corp., College Station, TX). The difference-in-differences analyses used linear regression models with the dependent variable being the outcome of interest, and included independent variables of time, treatment group, and a group*time interaction. Models controlled for potential confounding variables (age, gender, weight status) and corrected standard errors for the clustering of repeated measures. Alpha was set at $p < 0.05$.

6.4 RESULTS

6.4.1 Youth-leader Characteristics and Description of Intervention Implementation

All youth-leaders were racial or ethnic minorities (Table 6.2). Common themes identified by youth-leaders for wanting to participate in the BHCK program included: wanting give back or improve the community, passion for working with youth, and gaining experience/ building their resume.

Youth-leaders delivered 98 sessions in the recreation centers, which equaled 100% of the planned recreation center intervention sessions. An average of 10 youth attended and participated in taste tests at each session. Between the recreation center and store

intervention sessions, youth-leaders had over 1,600 unique interactions with participants. Youth-leader retention was high (75%). One youth-leader left the program after training due to interpersonal conflicts with other youth-leaders, one left within the first three months due to schedule conflicts with another job (many youth-leaders had additional jobs outside of being a youth-leader), and two left within the last three months of the intervention due to lack of interest.

6.4.2 Youth-leader Perceptions of Intervention Impact (Qualitative Results)

Perceived Intervention Impact on Youth-Participants. Youth-leaders expressed low levels of self-efficacy to influence the youth initially, which was mentioned during the interviews and was an important discussion topic brought up by the youth-leaders in training sessions. However, they later reported being pleasantly surprised by how much youth responded to the intervention sessions. One youth-leader demonstrated this by saying “they actually, like, listen and pay attention. I was so shocked they remembered.” In addition to remembering messages from previous sessions, youth-leaders also reported witnessing changes in youths’ behaviors. For example, the same youth-leader went on to explain, “I’ve seen someone change their beverage choice in the stores. I have seen children remember what I said to them last week and tell me what they did that week to make changes to what we talked about.”

Youth-leaders attributed some of their ability to impact youth to the relationships they were building with them over the course of the 14-session intervention. One youth-leader said “we know what to do to reach them, like, to get them to understand and to get them to want to change, and they know that we were once in their shoes.

And they kind of want be like us, so they're gonna do what they see us doing, and yeah, they wanna follow our lead."

Youth-leaders described also feeling their role was impactful on youth because it provided a caring interaction. A youth-leader described this by saying, "I get to be that person that I didn't have when I was a young person. Like, no one really sat down and told me and showed me healthy eating styles and ways. Now I get to do that for somebody else." In addition, by having many youth-leaders who lived within the intervention communities, youth-leaders reported having positive interactions with youth outside of the intervention sessions. One youth-leader reported, "when [youth-leader name] was in the market she saw one of the kids, they knew each other. The kids felt like somebody was looking out for them."

Perceived Intervention Impact on Youth-leaders' Personal Behaviors. Youth-leaders described that participation in BHCK impacted their health behaviors and life skills. Many youth-leaders reported making changes to their drinking habits (more water, less sweetened beverages), with other youth-leaders reporting reducing fast food consumption, eating appropriate portions, eating breakfast, and eating more fruits and vegetables. However, they often expressed this as a process of change, acknowledging that it was happening incrementally over time, one youth-leader reporting, "sometimes it's hard, but at the same time, [you] gotta start with baby steps." Youth-leaders expressed wanting to avoid being a "hypocrite" and that being consistent with the health messages they were providing youth in the BHCK intervention was a motivating factor that led to health behavior change. A youth-leader said, "I'm trying, I really am.

‘Cause I always tell myself, I can’t go and talk to children about healthy eating and making healthy choices when I am not doing it myself.”

Youth-leaders also described gaining life-skills, including group facilitation, interpersonal communication, and leadership skills from the BHCK intervention. For example, a youth-leader reported: “I learned new ways to teach and to go about presenting things that can be applied in real life...with children in the rec center, with college presentations, with talking with a little cousin about changing eating habits, everything.” Youth-leaders frequently reported that they felt like they were personally benefitting from the intervention, which encouraged continued engagement.

Perceived Intervention Impact on Individuals Outside of the BHCK intervention.

Youth-leaders frequently described sharing the new knowledge, skills, and strategies learned through the BHCK intervention in other interpersonal relationships (parents, siblings, friends, and co-workers). One youth-leader described sharing intervention information with her mother, saying “My mother knows what I am doing [as a youth-leader] so she just listens to me. Like when I come home, I always have something from here, I always have something new to tell her.” Another youth-leader described implementing intervention components with his younger siblings: “I’m like the water police at the house. I would see my brother and sister drink orange juice and they would already know that I am about to say something. At the house, everybody knows, eight cups of water a day.”

Youth-leaders also identified the youth-participants as potential drivers of change within their own social networks. This is illustrated by a youth-leader who said, “I think

kids have the ability of questioning their parents and their parents would just be like ‘who taught you that? Where did you get that from?’ Things like that will spark a change in a whole household.” Another youth leader acknowledged the limited reach of the youth-leaders, but also described the possibility of greater diffusion of messaging: “I know that we really can’t change the world, just trying to make an impact on at least a couple of children is good enough for me because even with the information we’ve given to the children, who’s to say that they’re not giving it to their friends or to their parents or sharing it with other people.”

The perceptions reported by youth-leaders in the in-depth interviews did not differ between males and females, however, some youth-leaders reported that they felt better able to engage with same sex youth-participants, and that the BHCK intervention could have been strengthened by having more male youth-leaders.

6.4.3 Intervention Impact on Psychosocial Factors, Dietary Intake, and Leadership Skills of Youth-leaders (Quantitative Evaluation).

Table 6.3 presents the mean values and unadjusted change scores for youth-leader’s food-related behaviors, psychosocial characteristics and leadership skills at baseline and post-intervention. Results of the difference-in-differences analyses (Table 6.4) found statistically significant changes over time in mean scores for healthy eating intentions, and friend support for healthy eating. The youth-leaders increased their intentions for healthy eating, while the comparison sample decreased their intentions to eat healthfully over time ($\beta=2.7$, Robust SE=1.2, $p=0.03$). Unexpectedly, for friend support for healthy eating, the youth-leaders reported decreased friend support for healthy

eating over the course of the intervention, while the comparison sample reported increased support ($\beta=-3.2$, Robust SE=1.4, $p=0.03$). Significantly different changes over time between the groups were not found in any of the other scales (data not shown).

6.5 DISCUSSION

This is the first study to use multiple research methods to evaluate the characteristics of youth-leaders, to assess their perceptions of intervention impact, and to examine the impact of the intervention on their dietary intake, psychosocial factors, and leadership skills.

The BHCK youth-leaders successfully carried out the intervention, delivering all of the planned intervention sessions (98 sessions) and interacting with youth regularly during those sessions. The majority of the youth-leaders stayed actively engaged in the BHCK intervention for the duration of the youth-leader component (10 months total). This high level of youth-leader retention was an improvement over previous studies conducted by the research team ³².

Youth-leaders described the impact of the intervention on themselves, the youth-participants and others not directly involved in the intervention. Youth-leaders described making efforts to change their eating habits to be consistent with the messages that they were promoting to youth-participants, which was seen in other youth-led studies ¹⁹². They acknowledged that the change process could be difficult, and were using “baby steps” to improve their habits. Youth-leaders also extended the impact of the nutrition intervention to their own social networks by sharing information and implementing intervention components with siblings, other family members,

friends, and co-workers. They described initial fears that they would be unable to engage and influence others with nutrition-related messages, and were surprised by the information youth-participants retained, and the changes that youth-participants shared with them. Similar to the principles of the Diffusion of Innovations theory ²²², youth-leaders described feeling they had the potential to create greater impact by working directly with youth, who would then go on to share their knowledge and experiences with friends and family members.

The results of the difference-in-differences analyses showed that youth-leaders' intentions to eat healthier foods increased more than comparison youth. This is consistent with the literature that demonstrates improvements in youth-leaders psychosocial factors ¹⁶³. This finding also triangulates well with the other qualitative and quantitative results in this study. Youth-leaders described wanting to make changes via "baby steps" in their eating and activity habits and that actually making those changes could be difficult. Seeing increases in behavioral intentions for healthy eating, but not changes in actual behavior (dietary intake) may reflect the difficulties in changing behaviors that youth-leaders describe.

An unanticipated finding was that youth-leaders had a decrease in their perceived support for healthy eating from friends, while intervention youth-leaders reported an increase in perceived support. We hypothesize that the decrease in youth-leader's perceived support from their friends may be related to their participation, as they received a significant amount of interaction and support related to eating behaviors as part of the BHCK program. This may have increased their awareness of the support (or

lack thereof) provided by their friends. However, this is only one possible scenario and additional analyses, such as follow-up in-depth interviews are needed to further assess these findings.

The limitations of this research should be noted. One potential reason for the limited number of statistically significant differences between the youth-leaders and comparison youth from baseline to post intervention could be the small sample size (16 youth-leaders and 10 comparison youth). In addition, despite blinding of data collectors, the participants may have experienced some social desirability bias in reporting their responses in efforts to make a good impression on program staff. To address this, future studies could modify the data collection procedures so that youth participants complete the questionnaires independently online or in group settings to increase feelings of anonymity in responses. Another limitation of this study was related to measurement issues with select psychosocial scales. In addition to the measures reported here, we also measured nutrition-related knowledge as a psychosocial construct, however, the internal consistency of this scale was very low (Cronbach's $\alpha=0.3$), and thus we did not include this measure here. However, changes in knowledge could be a potential outcome of interest for future studies. In addition, in future studies it will be important to collect data from the youth-participants to triangulate the data collected from other sources and to understand their unique perception of the intervention impact.

The strengths of this study include rigorous, multiple methods of data collection and analysis. This study provides a novel, intensive analysis of the youth-leader intervention

that was done in a specific population (urban, African American youth) that is said to be of high risk. While focusing on this population may limit transferability to other populations, this is an important, high risk population of interest to work with.

6.5.1 Recommendations for Future Research and Practice.

This study adds to the promising results seen from other youth-led nutrition interventions by demonstrating that youth-leaders are able to deliver interventions, that they perceive the interventions to have impact, and that the interventions have the potential to improve youth-leaders intentions to eat healthier. While this study begins to assess additional aspects of impact of youth-led programs (i.e., impact on the youth-leaders) future youth-led interventions are needed that enhance measurement of multiple impacts of the intervention, including the youth participants, the youth-leaders, and members of both groups' social networks.

Table 6.1: Sample Youth-leader In-depth Interview Questions

- Before you started, why did you want to be a youth-leader with BHCK? Why do you want to be a youth-leader with BHCK now?
- Can you tell me in your own words what you think the purpose of the BHCK program is? Do you think the program is affective at serving that purpose? Please explain your answer.
- How do youth-leaders differ from other people (teachers, etc.) that might work with youth around nutrition and health?
- Probe for nutrition/health knowledge (How ready do you feel like you are to deliver the BHCK program in the rec centers?)
- How have you handled working with the other youth-leaders? How have you handled working with the BHCK youth-participants?
- In what ways has the BHCK youth-leader training program affected you personally?
- What would you change about the youth-leader program?

Table 6.2: Anthropometric and Sociodemographic Characteristics of the BHCK Youth-leader Intervention and Comparison Samples

	Intervention n=16	Comparison n=10
Gender, n(%)		
Female	12(75%)	6(60%)
Age (M±SD)^a	20.2±1.6	17.9±1.8
Race, n(%)		
Black, African American	14(88%)	9(90%)
Pacific Islander	1(6%)	0(0%)
Other or Mixed Race	1(6%)	1(10%)
Ethnicity, n(%)		
Hispanic / Latino	1(6%)	0(0%)
BMI Category, n(%)^b		
Normal weight	7(44%)	6(60%)
Overweight	6(38%)	0(0%)
Obese	3(19%)	4(40%)
Education Level, n(%)^c		
4- year HBCU	8(50%)	1(10%)
Other 4-year University	0(0%)	3(30%)
Community College Student	7(44%)	1(10%)
High School Student	0(0%)	5(50%)
GED student	1(6%)	0(0%)

^aAge at intervention start, M±SD = Mean±Standard deviation

^bWeight status at intervention start. Classified by BMI-for-Age percentiles from CDC growth charts for youth <20 years old, and on standard cut offs for youth >20 years old

^cEducation level represents the type of student they were for the majority of the intervention

Table 6.3: Mean Scores for Dietary Intake, Psychosocial, and Leadership Measures Among Youth-leaders and Comparison Youth at Baseline and Post-Intervention

Measures ^{ab}	Scale Range	Intervention			Comparison			Unadjusted
		Baseline (n=16)	Post-Int. (n=16)	Change over time	Baseline (n=10)	Post-Int. (n=9)	Change over time	Difference-in- differences
Dietary Intake								
Total Calories	n/a	1435.1±554.1	1276.4±477.8	-158.7	1848.3±650.1	1602.2±607.6	-246.1	87.4
Fruit Serving	n/a	1.6±0.9	1.1±0.6	-0.5	1.0±0.5	0.9±0.6	-0.1	-0.4
Vegetable Servings	n/a	1.9±1.3	1.4±0.8	-0.5	1.7±1.6	1.3±1.0	-0.4	-0.1
Psychosocial Factors								
Self-efficacy	0-39	34.9±2.4	35.6±2.3	0.7	29.1±8.6	31.2±6.3	2.1	-1.4
Behavioral Intentions*	0-10	4.5±2.1	6.6±1.6	2.1	3.2±2.4	2.6±2.0	-0.6	2.7
Outcome Expectations	0-9	9.1±1.1	9.2±1.6	0.1	7.1±3.1	8.9±1.8	1.8	-1.7
Parent Support for Healthy Eating	0-16	7.8±5.7	5.4±4.7	-2.4	7.1±4.2	8.0±3.4	0.9	-1.5
Friend Support for Healthy Eating*	0-16	6.1±4.5	4.5±3.7	-1.6	2.3±2.2	3.9±1.6	1.6	-3.2
Parent Support for Unhealthy Eating	0-12	3.1±3.3	2.5±3.2	-0.6	3.4±2.6	3.6±2.4	0.2	-0.4
Friend Support for Unhealthy Eating	0-12	5.7±2.5	4.9±3.1	-0.8	7.3±3.3	8.1±2.5	0.8	-1.6
Leadership Skills								
Youth-leader Skills	0-39	29.8±6.4	33.3±5.7	3.5	29.7±3.3	30.0±7.3	0.3	3.2

^aAll measures are expressed at mean±standard deviation

^bHigher scores represent higher levels of each measure

*Statistically significant (p<0.05) difference in changes between groups over time

Table 6.5: Difference in Differences Results for Behavioral Intentions and Friend Support for Healthy Eating^a

Behavioral Intentions				
Variable Name	Variable Interpretation	β	Robust Std. Err.	P-value
Constant	Adjusted mean level for comparison at baseline	2.8	2.9	0.34
Treatment	Adjusted difference between baseline level for intervention compared to comparison group	1.3	0.9	0.18
Time	Adjusted mean change over time for comparison group	-0.6	1.0	0.55
Treatment x Time Interaction	Difference-in-difference estimate (adjusted difference in change over time for intervention compared to comparison group)	2.7	1.2	0.03
Friend Support for Healthy Eating				
Variable Name	Variable Interpretation	β	Robust Std. Err.	P-value
Constant	Adjusted mean level for comparison at baseline	-8.8	4.8	0.08
Treatment	Adjusted difference between baseline level for intervention compared to comparison group	2.0	1.2	0.11
Time	Adjusted mean change over time for comparison group	1.2	0.8	0.16
Treatment x Time Interaction	Difference-in-difference estimate (adjusted difference in change over time for intervention compared to comparison group)	-3.2	1.4	0.03

^a In all models: treatment group was coded as comparison (0) and intervention (1); time was coded as baseline (0) and post-intervention (1); age, gender (0=male, 1=female), and weight status (0=normal weight, 1=overweight/obese) were added as covariates; standard errors were corrected for clustering for repeated measures from the same individual.

CHAPTER 7. CONCLUSIONS

This chapter summarizes and draws conclusions from the research involved in this thesis. Here I present an overview of study findings in relation to the original study aims, a discussion of the strengths and limitations of the research, and an explanation of the implications from this thesis for future research and interventions.

7.1 SUMMARY OF THE MAIN FINDINGS

The overarching goal of this study was to assess aspects of multiple social relationships on dietary behaviors among urban, low-income African American adolescents in Baltimore City using several complimentary research methods and strategies, and to develop, implement and evaluate a social environment intervention delivered by youth-leaders within the multi-level BHCK parent study. Here we use the study aims from each of the sub-studies in this thesis to guide the discussion of the overall findings.

Sub-study 1 Research Aim: *To evaluate the relationship between youth's perceived social support for healthy and unhealthy eating behaviors provided by their parents and friends and diet quality.*

- **Research Question 1:** How frequently do urban African American youth perceive that their parents and friends provide support for healthy and unhealthy eating?
- **Research Question 2:** What are the relationships between perceived friend and parent support for healthy and unhealthy eating and diet quality among urban, low-income, African American youth?

Most of the youth studied reported receiving some level of social support for healthy and unhealthy eating from both their friends and their parents. While some variation existed, youth generally perceived their friends as providing support for unhealthy eating more frequently, and providing support for healthy eating less frequently. The opposite pattern emerged for parents, with youth reporting that parents provided support for healthy eating more frequently and support for unhealthy eating less frequently, which is consistent with the literature¹⁵⁰.

In this study, we hypothesized that youth with higher levels of social support from parents and friends for healthy eating would have higher diet quality compared to youth with friends and parents who provided lower levels of support for healthy eating. In contrast, we hypothesized that youth who received higher levels of support for unhealthy eating from parents and friends would have lower levels of diet quality. Our results did not find significant relationships between diet quality and friend's and parent's support for healthy eating or friend's support for unhealthy eating. These results were contrary to our hypothesis, however, not surprising given the literature, which shows mixed findings in this area^{150,151,146}. However, consistent with our hypotheses, an inverse relationship was found between parent support for unhealthy eating and diet quality, meaning that youth with higher perceived support for unhealthy eating from their parents had lower diet quality (lower HEI scores). These findings differ from the results of Fitzgerald and colleagues¹⁵⁰, who found that higher peer support for unhealthy eating was associated with unhealthy food intake. Our results suggest that researchers may want to consider assessing parental support for unhealthy eating when

conducting nutrition interventions with low-income, urban youth, however, additional exploration in this area is needed to fully understand these relationships.

Sub-study 2 Research Aim: *To conduct a mixed methods research study including a cross-sectional survey questionnaire along with in-depth interviews from youth and adult caregivers to assess the roles and interactions that social contacts have with low-income urban, African American youth around eating and physical activity, with the goal of developing a culturally informed, obesity prevention program for low-income, African American youth in Baltimore that incorporates social relationships into the intervention.*

- **Research Question 1:** What social relationships do youth identify as influencing eating and activity behaviors?
- **Research Question 2:** What roles do different social relationships play, and what type(s) of interactions do these individuals have with youth around food, nutrition, and physical activity?

In this study, low-income African American youth identified parents, grandparents, friends, siblings, other family members, teachers, and health care providers as individuals who interact with youth related to nutrition and physical activity behaviors. These findings are consistent with the literature^{242,234}. When reporting the interactions and roles that youth perceived their social contacts to play, they clearly identified parents as playing the most significant role in promoting healthy eating and physical activity habits; with grandparents (particularly grandmothers) also being highly influential. These findings are consistent with other investigations^{204,229,203,16,15,235,110}. Youth reported that parents and grandparents played multiple roles that influenced

their eating and physical activity behaviors, including: sharing knowledge about nutrition and physical activity, managing the home food environment, teaching food preparation methods, serving as physical activity role models, and setting rules and expectations for health behaviors.

Individuals such as friends, siblings, other family members, and professionals (teachers, health care providers) were perceived by youth as interacting with them around food and physical activity in specific areas only. For example, friends were perceived as individuals with whom youth actually engage in health-related behaviors (primarily related to active play, rather than healthier eating), which is similar to the current literature^{229,203,235,17,114}. Our findings show that other family members like aunts provided exposure to novel foods, and cousins participated in both physical activity and sedentary behavior with youth. Youth identified that teachers, school programs and healthcare providers mainly provided factual information about health-related behaviors, but their role did not expand beyond that.

This study provides novel information about youth's social interactions related to eating and physical activity. Experts acknowledge that intervening in the social environment can be difficult because it involves manipulating interpersonal relationships¹⁵⁵. By offering a snapshot into youth and adult caregiver's current perceptions of the roles that belong to different social agents, this study provides important information for designing social interventions. Delivery of this type of health promotion intervention may be enhanced among youth populations by capitalizing on the social roles that youth currently perceive. However, the impact of introducing new

social roles, outside of the roles that youth currently perceive others to play could also be an interesting area for investigating.

Sub-study 3 Research Aim: In a participatory process with youth, to implement and evaluate a youth-led nutrition intervention delivered primarily in Baltimore City recreation centers, as part of the BHCK multi-component intervention.

- **Research Question 1:** What are characteristics of youth who participate as youth-leaders? Are they able to implement the intervention?
- **Research Question 2:** What were youth-leaders perceptions of the program implementation, and its impact on themselves and the youth participants?
- **Research Question 3:** Did participation in the youth-leader program improve psychosocial factors, food-related behaviors, and leadership characteristics of youth-leaders beyond what was seen a comparison group?

This study found that on a basic level, BHCK youth-leaders successfully carried out the intervention. Specifically they delivered all planned intervention sessions in the recreation centers, and interacted with moderate-sized groups of youth at each session. The majority of the youth-leaders stayed actively engaged in the BHCK intervention for the entire duration of the 10-month youth-leader component (including training and intervention delivery). This was an improvement over previous studies conducted by our research team³². Additional intervention implementation metrics would be beneficial, but are outside the scope of this thesis and are being published elsewhere²¹⁵.

Youth-leaders described the impact of the intervention on themselves, the youth-participants, and others not directly involved in the intervention. Youth-leaders

described making efforts to change their eating habits to be consistent with the messages that they were promoting to younger youth as part of the BHCK intervention. Similar findings were also reported by youth-leaders in an intervention conducted in a similar population by Black and colleagues¹⁹². Youth-leaders frequently reported sharing information and implementing intervention components with siblings, other family members, friends and co-workers. Youth-leaders perceived that the youth participant's behaviors and psychosocial factors were being influenced by the intervention because the youth were able to remember the intervention principles between the sessions and were able to describe the changes they were making. Youth-leaders reported feeling they had the potential to create greater impact by working directly with youth, who would then go on to share their knowledge and experiences with other friends, and family members. This theory has been demonstrated in a previous study¹⁷⁰.

When assessing changes over time in youth-leader's dietary intake, psychosocial factors, and leadership skills relative to the changes seen in a comparison group of youth, results showed that the behavioral intentions for healthy eating of the youth-leaders increased beyond what was seen in the comparison group. Other studies have also shown improved psychosocial factors in youth-leaders¹⁶³. An interesting finding was that perceived support from friends for healthy eating increased less in the youth-leaders than in the comparison group. We can only speculate that youth-leaders intensive exposure to the nutrition information through the intervention may have made them more aware of the support (or lack thereof) provided by their friends. Despite these important findings, there were few other measured changes seen

between the youth-leaders and comparison group. One potential reason for this may be measurement error. Another potential reason is that the duration of the study may have been too short to see changes, as the youth-leaders provided narratives describing the small changes they were making, and expressed increased intentions to eat healthfully, however, additional time may have been needed to actually cause measurable behavior change.

7.2 STRENGTHS AND LIMITATIONS

To our knowledge this was the first study to examine social support for unhealthy eating in a low-income, urban, minority population; to use mixed methods research to assess the social roles and interactions of a variety of social contacts with youth; and to successfully implement and evaluate a youth-led intervention combined with a larger, systems-oriented obesity prevention intervention. This thesis provides novel data to support our understanding of the influence of social relationships on youths' eating behaviors, which is relevant to creating interventions to target the social environment. This body of work involves multiple complementary research strategies including quantitative, qualitative, and mixed methods designs that work together to triangulate findings and provide an enhanced understanding of the results. The use of multiple methods helps to reduce the limitations of each individual research method, strengthening the body of work.

The research methods related to the development of the youth-led intervention components were very strong as they were conducted in a participatory process with the youth-leaders and with community partners. Youth-leaders were involved in

curriculum and intervention material design, and given a strong voice in managing the intervention delivery, which likely enhanced their engagement and retention in the intervention.

In addition to the rigorous methods used, a major strength of this work was that it was planned and conducted in partnership with several other intervention components within the BHCK study. The youth-led intervention components took place in a context where parents were receiving text and social media messages to promote healthy eating, corner stores and carry-outs were stocking and promoting healthier food options, and on the macro-level food policies were being promoted to improve the nutritional health of the community. The combination of these interventions strategies allowed for youth to be receiving messages and making decisions in an environment that takes a systems-approach to promoting health.

Another way in which this thesis is strengthened by being nested within the BHCK study is that BHCK creates potential for additional measures and analyses that are beyond the scope of this thesis. For example, the larger BHCK intervention will also provide resources to do an intensive process evaluation of the reach, dose, and fidelity of the youth-led intervention components. The BHCK intervention will also assess the influence of the youth-led intervention component on the youth-participants through an impact evaluation of the entire BHCK study, with intervention exposure measures that attempt to tease out the affects of each of the intervention components.

Despite the many strengths of this study, it is important to consider the study limitations when interpreting the results. One important limitation of this study was that

it was completed in a very specific population: urban, low-income, African American youth living in Baltimore City. This is a limitation because the results presented in these studies may not be transferable to other groups or settings, however, it may be plausible that many of the findings of this study are readily applicable to other similar-aged youth. This thesis serves as a mechanism to enhance transferability as it provides full descriptions of the relationships identified and the context in which the research took place, along with detailed information on the participants and how the information was collected. Presenting this information will allow others to evaluate the potential level of transferability to their population/settings of interest. It is also important to note that the population of interest in this research is important to examine because they often experience a lack of health equity in many areas, especially concerning weight and diet-related health outcomes^{2,7,6}. Culturally-tailored interventions may promote more equitable health outcomes ²⁴³.

Additionally, there were some limitations to the measurement strategies and methods used in this thesis. For example, the first study that looked at social support used scales that were adapted from validated measures¹⁵¹ and published in the literature¹⁵⁰, however, through this research, it was noted that internal consistency of these scales could be improved. While we took steps to address this issue by revising the social support for unhealthy eating from friends scale, and conducting post-hoc analyses, these remain important limitations to consider.

In the study examining the impact of participating in the BHCK intervention on youth-leaders we found that many youth-leaders and comparison youth reported very

high scores on many of the measured scales at baseline (i.e., high levels of self-efficacy for eating healthy, high levels of confidence in their ability to deliver the BHCK intervention). These scores may have been inflated by social desirability bias, as the youth-leaders and comparison youth had both just applied for the youth-leader position, and potentially wanted to impress the interviewer, despite the interviewer being blinded to intervention group. This may have limited our ability to see changes over time among the youth-leaders.

Another limitation of this study, and the larger BHCK study, is lack of intervention components related to physical activity. While the recreation center curriculum focused on active, experiential learning methods, additional focus on physical activity is important and has the potential to enhance health outcomes.

7.3 IMPLICATIONS FOR FUTURE RESEARCH AND METHODOLOGY

The research conducted within this thesis provided novel information using strong research methodologies, however, the limitations of the research design should be addressed in future research efforts. Here we present strategies for addressing limitations identified in this study, and describe potential areas that warrant continued research.

Improved Measurements for Social Support for Unhealthy Eating. The measures of social support for unhealthy eating showed potential for problems with internal consistency and therefore should be improved before further use. Due to the lack of other studies examining social support for unhealthy eating, there is limited literature demonstrating alternative ways to measure this construct. Validation efforts

should be undertaken to modify and improve this scale, and thereby enhance the ability to measure social support for unhealthy eating among youth and adolescent populations.

Improve Strategies for Measuring Intervention Effects among Youth-leaders. In this study, youth-leaders and a comparison group of youth were assessed at baseline and post intervention. At baseline youth-leaders and comparison youth both provided responses to scales that fell at the high end of the metrics we were using to assess outcomes, leaving very little room for improvement over time. This could be addressed in several ways, the first step would be to adjust and pilot test of measurement scales to insure a broader range of responses in future studies. Another potential way to improve this is to increase the perceived anonymity of the youth-leaders survey responses by having youth-leaders complete them online or in a group format rather than in a one-on-one format with a data collector to reduce social desirability bias.

7.4 IMPLICATIONS FOR FUTURE PRACTICE AND INTERVENTION IMPLEMENTATION

Designing, implementing and evaluating the studies that are a part of this thesis provided many opportunities to reflect on which strategies were most influential to the success of intervention delivery. This section describes recommendations for future practice and intervention implementation based on the results of the studies, along with crucial lessons learned in the process of implementing the studies.

Assessing and addressing support for unhealthy eating. This research found that youth may be receiving support for unhealthy eating from their parents and friends. Specifically, the types of support for unhealthy eating measured in this study

involved parents/friends encouraging, offering, or saying nice things about high fat food or sweets to youth. This support for unhealthy eating may be particularly problematic if it is coming from parents, as we found some evidence that support for unhealthy eating from parents is related to lower diet quality in youth. Researchers and professionals who are designing family-based nutrition-related interventions for youth may want to consider these results and test different intervention strategies to increase parents' awareness of their support for unhealthy eating, and promote alternative behaviors to replace support for unhealthy eating.

Awareness of youth's preconceptions of social roles relating to eating and physical activity. Youth's perceived roles of their social contacts related to eating and activity behaviors should be considered when designing social environment interventions. For example, youth perceived grandmothers as individuals who teach others how to prepare food, so multi-generational healthy cooking classes may be a possible intervention strategy. Youth also perceived their friends as individuals who would perform physical activity with them; so physical activity interventions could be designed to incorporate pairs or small groups of friends. Another potential intervention related to this would be involving youth-leaders in interventions where they do physical activity with youth participants. Like these examples show, researchers and practitioners may want to consider working within the identified social roles that youth perceive others to play, or otherwise be prepared to address barriers related to attempting to change existing social roles.

Enhancing youth-leader intervention delivery. Several key strategies were identified through the process of implementing and evaluating the youth-led intervention components. Future interventions that involve youth-led components should consider these recommendations when designing their interventions. We valued providing intensive training to youth-leaders prior to the intervention start, and feel that the delivery of regularly scheduled booster/support training sessions throughout intervention delivery was necessary. Training sessions provided opportunities for youth-leaders to gain skills and experience, discuss problems or issues, and to build trusting relationships with the other youth-leaders and BHCK staff, all of which we hypothesize greatly enhanced youth-leader retention and intervention delivery.

Additional strategies could be put in place to reduce barriers to youth-leader participation and enhance youth-leader retention. Youth-leaders have many competing interests in their lives (school work, other jobs, social pressures). Strategies to reduce barriers for continued youth-leader participation include: payment for time spent working in the youth-leader position along with the opportunities for bonuses when extra work is done, flexibility with youth-leader scheduling to adjust for other school and work-related needs, assistance with transportation (including subsidizing bus fare) if youth-leaders do not have access to personal transportation. Additionally, involving youth-leaders as much as possible in the process of developing the intervention (curriculum development and modification, materials preparation, etc.) may be useful to enhancing engagement and buy-in from youth, as they feel like they are actively engaged in the process. In the BHCK intervention youth-leaders were actively

encouraged to provide feedback on curriculum components, and modify certain aspects of the intervention delivery prior to implementation.

Finally, the sustainability of youth-led interventions should be considered as part of the intervention design. In this study, the BHCK study team obtained buy-in from the Baltimore City Recreation and Parks Department and had grant funding from other sources to transition the youth-led recreation center intervention to be self-sustaining through a train the trainer model that would engage youth already in attendance at the recreation centers to deliver the intervention to the younger youth participants. Because of the time-intensive nature of youth-led interventions these and other strategies should be considered when designing interventions to maximize public health impact.

Appendix A:
In-Depth Interview Guides

B'More Healthy: Communities for Kids (BHCK)

Youth In-Depth Interview Guide

Interviewer Name:

Youth Name(s):

Data checked by:
Date of checking:.....
Data entered by:
Date of entry:
Form ID:
Worksite ID:.....

Address(es): _____

Date: ____/____/____ Interview start time: ____:____AM/PM Respondent

Purpose of this interview

Hi, my name is _____ from Johns Hopkins University and we work on a program called B'more Healthy: Communities for Kids. Thank you for making time to meet with us. The project encourages store and carryout owners to stock foods that are good for your health and encourages young people like you to buy these healthier foods. We are hoping to help bring fresh and healthy foods to corner stores and carryouts in Baltimore where you shop. I will be asking you questions about food and about your experience with gardens and farms here in Baltimore.

[consent/assent form here]

Ice-breaker questions:

- Could you take me through your typical day and explain it?
 - Probe on weekend versus weekday
- What do you like to do in your free time?
- What is your favorite food? Tell me more about that food.
 - Probe for rationale for selection this foods as 'favorite'
 - Probe for stories about the significance of this food
- Please tell me a little about your family and the neighborhood you live in.

Getting food questions:

- Talk about the places in your neighborhood that people in your neighborhood usually go to get food?
 - Probe on convenience stores, corner stores, etc...

- Tell me about all of the places you got food in the last week or so.
 - Probe on weekend versus weekday
 - Probe on reasons for going to those places to get food
 - Probe on who accompanies the youth to the food source
 - Probe on family dynamics, home cooking
- You just talked about your family's eating behavior. Could you tell me more about how your family eats and buys food?

Healthy foods questions:

- OK, you're doing a great job. Now I want you to tell me what you think about when I say "healthy foods"?
 - Probe for a story or narrative
- Could you talk about what makes a food good for you?
 - Probe on where would you get these foods?
 - Probe on their perceived cost
 - Probe on their perceived taste and other organoleptic properties
- Can you describe a food that's good for you that you like?
- Why do you think a person your age should try to eat healthy?
 - Probe for motivators for healthy eating
 - Probe to determine level of importance of healthy eating to the child
- If someone told you that "this food is healthy", through a poster for example, what kinds of things would come to your mind?
 - Probe on whether youth would you buy it.
 - Probe on whether this food would be chosen over something else usually bought.
 - Probe on whether youth's caregiver would choose the healthy food

Behavior change questions:

- Tell me about times when you have made changes to what you eat?
 - Probe for a story or narrative
 - Probe for another habit they changed, if no changes to what they ate.
- What might make you or help you change the way you eat in the future?
 - Probe for recommendations or suggestions
- Can you tell me about a time when you learned something about nutrition?

- Probe for communication channels they liked
- Probe for peers

Peer influence questions:

- Can you describe the older kids in your neighborhood?
 - Probe if you had to ask someone for advice, who would you ask? Why would you ask that person?
 - Probe for advisory role of peers
 - Probe for qualities/characteristics of person selected
- Can you describe someone that you look up to? Why do you look up to that person?
 - Probe for qualities/characteristics of person selected
 - Probe for peers
 - Probe for factors that might be most influential to the youth
- Tell me a little bit about the types of foods that your friends eat and foods that they buy when you are together.
 - Probe for places food is purchased/ consumed with friends (carryout, corner store, Rec Center, school, at home)
 - Probe on meals versus snacks
 - Probe for frequency of purchasing/consuming foods with friends
- How do your friends' choices for food affect the foods you eat?
 - Probe for peer influence of food selection
 - Probe for peer influence on consumption patterns (eating more/less, eating foods not normally consumed)
 - Probe for factors that might be most influential to the youth

Youth Leadership Questions

- Can you describe any times that you were responsible to for an activity? This can be in school or outside of school.
 - What was difficult about this experience? What was helpful?
 - Probe for stories associated with leadership activities
 - Probe for decision making process in taking leadership role
- What does being a 'leader' mean to you?
 - Probe on the concept of a leader, and leadership roles versus mentoring roles
 - Probe for emic terms for mentors, leaders
- If you had to encourage other kids your same age to eat healthier and be more active, how would you do that?

- Probe for youth-identified nutrition and physical activity issues
- Probe for barriers and facilitators to change
- Why is helping other kids eat healthy and be active important to you?

Rec center questions:

- Now I am going to ask you a few questions about this Rec Center. What do you do when you come here?
 - Probe for preferred and disliked activities
 - Probe for amount of time spent at the Rec Center
 - Probe for level of structure of Rec Center activities
- Are there any foods that are not offered at your corner store that you would like to see?
 - Probe for factors that would make youth more likely to buy produce in a corner store (display, appearance, source (which farm), price, freshness, promotional poster, etc.)
 - Probe for barriers to purchasing produce such as cost, appearance, taste, etc.
 - Probe for where youth think corner stores get fresh produce from (wholesale versus local farmers). Why?
 - Probe for how youth would feel if store does not offer desired fruit or vegetables. If anything, what would youth do? Does youth think the store owner is likely to respond to youth's request? Why?
 - Probe for additional places to buy fresh produce (school, rec center, farmer's market, farm stand)

Time-permitting:

- What kinds of things to eat do you usually buy?
 - Probe on why youth buys these foods
 - Probe on comparison of these foods to other less-desirable foods
- What kinds of things to drink do you usually buy?
 - Probe on why youth buys these drinks
 - Probe on comparison of these drinks to less-desirable drinks
- Tell me about how you decide what you want to get at (food source)?
 - Probe on decision points
 - Probe on when and where the decision is made
 - Probe on main factors that youth thinks about when deciding to buy a food

Close of interview:

- Do you have any questions for me or last comments? Thank you so much for your time.

Interview end time: ____:____AM/PM Respondent

Caregiver/Parent Interview Guide

Interviewer Name: _____

Data checked by:
Date of checking:.....
Data entered by:
Date of entry:
Form ID:

Date: ____/____/____ Interview start time: ____:____AM/PM

Respondent Name: _____

Respondent's address:

[Consent form here]

Purpose of this interview

I am working with a program that is helping to bring healthier and more affordable food to stores in East and West Baltimore. The project will work with wholesalers and retail store owners to stock foods such as low-fat milk, whole wheat bread, low calorie drinks, and low sugar cereals, and encourages customers to buy these healthier foods. With some store owners, we will work to get some of these healthier foods available at lower prices. We'll also be working with the recreation centers in Baltimore on a program to promote nutritious diets and physical activity for kids. The purpose of this interview is to help us understand how you and your family shop for and prepare food. You have been chosen to participate in the interview because you purchase foods from a retailer in our program area and have a child who attends a Baltimore City recreation center. During the interview, I will ask you how you make decisions about where to shop and what to buy, how price and availability impact those decisions, and what could be done to change where you shop or what you eat. I will also ask you about you and your child's diet and food shopping. Please answer the questions truthfully and to the best of your ability. There are no right or wrong answers. We are (I am) only here to gather information. Everything that is being spoken here is considered confidential.

- To start, What is your favorite food? Tell me more about that food.
 - Probe for rationale for selection this foods as 'favorite'
 - Probe for stories about the significance of this food
- Can you tell me about what you eat on a typical day?
 - Probe for extent to which meals are prepared or purchased
 - Probe for barriers/facilitators for meal preparation at home (e.g., employment, comfort with different cooking techniques)
 - Probe on food on weekday versus food on weekend day
- Could you now tell me about all of the places you got food in the last couple of weeks?
 - Probe on how consumer got to these stores (e.g., walk, drive, public transport, etc...)
 - Probe on frequency of meals at small vendors such as carry-outs
 - Probe for frequency, typical foods procured at different places
 - Probe on reasons for choosing these different places (esp. relationships with food vendors)

- You're doing a great job. Now I'm going to ask a few questions about the people who live with you and the things they eat.
- Can you tell me a little about the people who usually stay with you?
 - Probe for patterns of eating among children (and their ages)
 - Probe for patterns of eating among people who share meals or food
- Great, let's talk more about [name of child aged 10-14]. Can you describe for me in more detail what s/he eats on a typical day?
 - Probe for participation in school breakfast/lunch programs, meals or snacks at recreation centers
 - Probe for extent to which child eats within household/with family members
 - Probe for the extent to which child eats with friends/peers
 - Probe for differences between summer and school year
 - Probe for differences between weekday and weekend
- What kinds of foods does [child's name] like to eat?
 - Probe for reasons the child chooses those foods
 - Probe for foods the caretaker sees as healthy options for the child
 - Probe for foods caretaker wishes the child would eat
 - Probe for foods the caretaker finds unacceptable and reasons why they are unacceptable
- Does [child's name] ever prepare his or her own food?
 - Probe for frequency and types of foods prepared at home
 - Probe for whether food preparation is done together with caretaker
 - Probe for where the child learned to prepare these foods (e.g. school, rec center, etc.)
 - Probe for influence (if any) this behavior has had on others in family or child's friends
- Does [child's name] ever buy his or her own food?
 - Probe for typical places (e.g., corner stores, carry-outs)
 - Probe for reasons the child buys his or her own food
 - Probe for attitudes of caretaker toward child's buying food on his or her own
 - Probe for typical frequency
 - Prove for typical expenditure
- What sorts of things do you think make [child's name] more likely to buy [food mentioned above]?
 - Probe for peer influence (ask for a detailed description here)
 - Probe for caretaker influence
 - Probe for influence of price
 - Probe for marketing influence

- Now, I am going to ask you a little bit about the Rec Center your child attends. How does [child's name] spend their time at the Rec Center?
 - Probe for time spent at the Rec Center (number of days a week child go to Rec Center, how long they spend there, etc.)
 - Probe for types of foods served at the Rec Center (meals/snacks and actual foods).
 - Probe for caretakers perception of programs offered and participated in by child (what child prefers/dislikes doing at the Rec Center)
 - Probe on engagement of parent in Rec Center
- Let's talk about healthy foods in your community now.
- When I say a food is "healthy" what does this mean to you?
 - Probe for whether this word conjures up positive or negative feelings
 - Probe for caretaker's perception of child's understanding of what "healthy" means
- Could you talk about the kind of information that you consider when purchasing food?
 - Probe on the potential influence of health or nutrition information on purchasing behavior
 - Probe on the influence of peers or significant others
- Have you noticed information regarding healthy foods in your community? (e.g., at the stores you shop in or at community institutions)?
 - Probe on the kind of information presented
 - Probe on the impression of such information
 - Probe on perceived information children are exposed to and its impact
 - Probe on recommendations for other types of information as a consumer and caretaker
 - Probe on suggestions for other ways to present the information
- We're developing some ideas to promote healthy eating in this community. Do you have any ideas that might help us?
 - Probe on making food more available (get specific details)
 - Probe on ways to incorporate recreation centers
 - Probe on ways to educate
 - Probe on use of peers to promote healthy choices (ask for specific details about who the child looks up to and would seek advice from)
 - Probe on the use of posters/flyers (get specific details)
 - Probe on food labels

Do you have any questions, comments, or suggestions for me? Thank you so much for your time.

B'More Healthy: Communities for Kids (BHCK)

Youth-leader In-depth Interview Guide

Interviewer Name: _____

Data checked by:
Date of checking:.....
Data entered by:
Date of entry:
Form ID:

Youth Name(s) and age(s): _____

Address(es): _____

Date: ____/____/____ Interview start time: ____:____AM/PM

Purpose of this interview

Hi, my name is _____ from Johns Hopkins University and we work on a program called B'More Healthy: Communities for Kids. Thank you for making time to meet with us. The project encourages store and carryout owners to stock foods that are good for your health and encourages young people to buy these healthier foods. We are also hoping to develop youth-leaders who will work with younger kids in Baltimore City Recreation Centers or other community sites to help us teach kids about healthy eating. Today we are going to talk about your experiences working with the BHCK youth-leader training program.

[consent/assent form here]

Ice-breaker questions:

Before you started the training program, why did you want to be a youth-leader with BHCK?
Why do you want to be a youth-leader with BHCK now?

- Probe for changes that have occurred during the training program

Can you tell me in your own words what you think the purpose of the BHCK program is?
Can you tell me why you think it is important that youth-leaders are involved in the BHCK program?

Tell me about the things you did in the youth-leader training program.

What did you learn as part of the youth-leader training program?

- Probe for team building skills
- Probe for youth-leader skills

- Probe for nutrition/health knowledge

How ready do you feel like you are to deliver the BHCK program in the rec centers?

- What makes you say that?

What else do you feel like you need to be ready to deliver the BHCK program in the rec centers?

- What makes you say that?

What did you like about the youth-leader training program?

- Probe for structure and content-related components of the program

In what ways has the BHCK youth-leader training program affected you personally?

- Probe for influence on diet and physical activity habits

What would you change about the youth-leader training program?

- Probe for components to add.
- Probe for components to remove.

Close of interview:

- Do you have any questions for me or last comments? Thank you so much for your time.

Interview end time: __: __AM/PM Respondent

Appendix B:

**Child Impact Questionnaire and Block 2004 Kids Food Frequency
Questionnaire**

DATE: ____/____/____

Data Collector: _____

Rec Center Zone: _____

Section 1. Demographic & Contact Information

1. Respondent ID #: _____

2. Respondent Name: _____

3. Respondent Date of Birth: _____ Age: _____

4. Respondent Sex (Circle): M F

5. Respondent Race (Check all that apply):

- ☐ American Indian/Alaskan Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian/Other Pacific Islander
- ☐ White
- ☐ Other: _____

6. Respondent Ethnic Background (Check):

- ☐ Hispanic or Latino
- ☐ Not Hispanic or Latino
- ☐ Other: _____

7. Street Address (Primary): _____

8. Street Address (Alternate): _____

9. Phone Number: #1 _____ #2 _____
#3 _____

Type (i.e. mom's cell) #1 _____ #2 _____ #3 _____

10. Name of Caregiver: _____

11. Relationship of Caregiver to Participant: _____

12. Phone Number for Caregiver: _____

13. Email Address for Caregiver: _____

INTRODUCTION

“Before we begin, I want to give you some important information about this survey.

- This survey is about the foods that you buy. This means that I will ask you questions about times when you yourself had money and used it to buy food for yourself.
- All information collected will not be shared with anyone.
- There are no right or wrong answers.
- Telling us about the foods that you buy will help out kids your age in Baltimore eat healthier, so please be as honest as you can be.
- If you can't remember or if a question seems odd, just ask me and I will explain as well as I can.
- Thank you for your help.”

Section 2. Food Purchases

“First we are going to talk about times when you have bought food for the people whom you live with.” (Read each answer choice. CIRCLE ONLY ONE RESPONSE.)

14. How do you help with food shopping for your household (your household is the people who you usually eat with)?

- a. I never shop for food for my household.
- b. I go with the main food shopper on most trips to the food store (more than 50% of trips to the food store).
- c. I go with the main food shopper on some trips to the food store (less than 50% of trips to the food store).
- d. I sometimes do the food shopping for my household without an adult.
- e. I do all or most of the food shopping for my household without an adult.
- f. Other (please specify): _____

“I’m going to ask you some questions about when you buy food for yourself. I am only interested in times when you spend money on food for yourself. [You can include foods that you might buy for others that you eat too. Please don’t include foods that others bought for you.]”

15. Think about all the places where you bought food during the last 7 days, from last ____ to _____. What are the all places that you shop in each category? [If child shops at less than 3 stores in a category mark the column “I do not shop at this type of food source” in each column for which there is not a response. Where are they located? How often did you shop there in the last 7 days? If child shops in more than 3 of any type of food source mark source type and name in extra rows that follow.]

(Read each food source)

Food Source Type & Name	Times patronized in the last 7 days (If did not shop there, mark as zero)	Address/Store code for each food source	Who was with you on MOST trips to this place? Circle one.	
Supermarket / Grocery Store				
1.			Friend Alone	Family: Other:
2.			Friend Alone	Family: Other:
3.			Friend Alone	Family: Other:
Corner store				
1.			Friend Alone	Family: Other:
2.			Friend Alone	Family: Other:
3			Friend Alone	Family: Other:
Convenience store (like a 7-11)				
1.			Friend Alone	Family: Other:
2.			Friend Alone	Family: Other:
3.			Friend Alone	Family: Other:
Fast food restaurant/ carry-out				
1.			Friend Alone	Family: Other:
2.			Friend Alone	Family: Other:
3.			Friend Alone	Family: Other:
School / rec center				
1.			Friend Alone	Family: Other:
2.			Friend Alone	Family: Other:
3.			Friend Alone	Family: Other:

Other (truck, arabber, drug store)				
1.			Friend Alone	Family: Other:
2.			Friend Alone	Family: Other:
3.			Friend Alone	Family: Other:
EXTRA: Type and name of categories with more than three places Ex: 'Carryout : Jo's Lake Trout'				
1.			Friend Alone	Family: Other:
2.			Friend Alone	Family: Other:
3.			Friend Alone	Family: Other:
4.			Friend Alone	Family: Other:
5.			Friend Alone	Family: Other:
6.			Friend Alone	Family: Other:

16. Now I want to get an idea of how often you buy some foods. Please think back over the last 7 days, from last ____ to _____. I'm going to name some foods, and I want you to count for me the number of times **you bought** them for **yourself** in the last 7 days. [You can include foods that you might buy for others that you eat too. Please don't include foods that others bought for you.] I will also ask you where you bought them most of the time.

(This section must be completed, even if they report not purchasing any food for themselves in previous section. To administer, read one food item, and ask how many times they bought the food in the last 7 days. Write down the # in the first column. Ask where they bought it most often, and read aloud the food sources. Put a check mark (✓) in ONE column.)

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
Beverage							
Regular soda (include Grape Soda) (Brand(s): _____)							
Diet soda (include Coke Zero, Sprite Zero, Dr. Pepper 10, Pepsi Next)(Brand(s): _____)							
Fruit punch or Hugs fruit drink							
100% Fruit juice (Like Juicy Juice, Welch's)(Brand(s): _____)							
Plain Water							
Fruit flavored water (Brand(s): _____)							
Sugar free drink mixes (like Crystal Light)							
Whole milk							
2% milk							
1% or skim milk							
Sports drinks (Gatorade)							
Sweetened iced tea/ Half and half							
Unsweetened tea/ Diet half & half							
Energy drinks (Monster, Red Bull)							
Any other drinks (Type: _____)							

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
Fruit & Vegetables							
Apples							
Applesauce							
Bananas							
Oranges							
Other fresh fruit (Type: _____)							
Frozen fruit (Type: _____)							
Canned fruit/ Fruit cups							
Dried fruit (like raisins)							
Baby carrots (with or without dip)							
Celery (with or without dip)							
Cucumber (with or without dip)							
Other fresh/frozen vegetables (Type: _____)							
Canned vegetables							
Any other fruit or vegetables (Type: _____)							
Whole Grains/ Grocery Items							
White bread							
100% Whole wheat bread							
Sugary cereal (like Froot Loops, Cap'n Crunch) Brand(s): _____)							
Low sugar cereal (like cheerios, rice krispies) Brand(s): _____)							
High Fiber Cereal (like Shredded wheat, bran flakes) Brand: _____)							
Hot cereal (oatmeal, grits)							
Tuna (canned)							
Cooking spray							
Any other groceries (Type: _____)							
Fast Food							
Hamburger or Cheeseburger							

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
Pizza							
Fried chicken (include Chinese fried chicken wings)							
Grilled chicken							
Fried seafood (fish, shrimp, etc.)							
Grilled seafood							
French fries or tater tots (include cheese fries)							
Fruit side dish (Type: _____)							
Vegetable side dish (include green salad) (Type: _____)							
Subs/sandwiches/wraps (like cheesesteaks, fried chicken or fish sandwiches) Type: _____							
Subs/sandwiches/wraps (sliced deli meat) Type: _____							
Chinese food							
Tacos/burritos/nachos/quesadilla							
Any other carry-out food (Type: _____)							
Any other carry-out food (Type: _____)							
Any other carry-out food (Type: _____)							
Snacks							
Chips or cheese curls (Type(s): _____)							
Baked chips (Type(s): _____)							
Reduced-fat chips (like R.F. Doritos) (Brand: _____)							
Pretzels							
Dried fruit, nuts or seeds (like sunflower seeds)							
Baked goods (cookies, snack cakes, donuts, poptarts)							
Yogurt							
Granola bars (like Quaker)							

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
Chocolate candy (like snickers, hershey's, M&M's)							
Other candy (like Skittles, gummy bears, life savers)							
Ice cream							
Juice popsicles							
Snow cones or snow balls							
Any other Snacks (Type _____)							

17. How much money do you usually spend when you go to the corner store or convenience store? _____dollars per visit

18. How much money do you usually spend when you go to the carry out or fast food restaurant? _____dollars per visit

Section 3. Food Preparation Environment

“Now I am going to ask you some questions about what kinds of food you eat at home. Think back over the past 7 days, from last ___ to ___.”

19. In the past 7 days, how often did a member of your household prepare food for you?

- A. Never
- B. 1 time per week
- C. 2-3 times per week
- D. 4-6 times per week
- E. 1 time per day
- F. 2 or more times per day

20. In the past 7 days, how often did you prepare food for yourself or others (including making yourself lunch)?

- A. Never (*if never, skip to question #22*)
- B. 1 time per week
- C. 2-3 times per week
- D. 4-6 times per week
- E. 1 time per day
- F. 2 or more times per day

21. You said that you prepared food ____ (read # of times from question #20). What foods did you prepare? (**Write each food item in the left column, one item per row.**) In the last 7 days, how did you prepare ____ (Read each food item separately, and leave open-ended. Put a check mark (✓) in each applicable column for preparation method.) Record anything added to the foods.

FOOD (write one item per row)	PREPARATION METHOD					
	Fried (deep or pan)	Baked (or toasted)	Micro waved	Not cooked (like cereal)	Other (specify: grilled, broiled added boiling water)	Was anything added? (write out)

Section 4. Intentions about Foods

"I am going to read a statement and three food choices. Please tell me which food you would really choose to eat, given your life right now. (CIRCLE ONLY ONE RESPONSE)

22. If you wanted a snack, which would you pick?

- A. Potato chips
- B. Pretzels
- C. Yogurt

23. If you were thirsty, which would you choose for a drink?

- A. Soda
- B. Fruit-flavored water
- C. Plain Water

24. If you had to eat cereal, which would you choose?

- A. Kix
- B. Life Cereal
- C. Froot Loops

25. The next time you want an after-school snack, which would you choose?

- A. Sunflower seeds
- B. French fries
- C. Candy

26. If you had to eat at a fast food restaurant or carryout, which meal would you choose?

- A. Burger (regular or cheese)
- B. Turkey sandwich
- C. Fried chicken

27. If you had to eat a vegetable, which would you choose?

- A. Baby carrots
- B. Corn
- C. Potatoes

28. If you had to drink a fruit beverage, which would you choose?

- A. Crystal Light (sugar-free drink mix)
- B. Fruit punch (including Hugs)
- C. Fruit flavored soda (like orange or grape soda)

29. If you had to choose a fruit snack, which would you choose?

- A. Apple with caramel dip
- B. Grapes
- C. Fruit roll-up

30. If you had to put something on a sandwich, which would you choose?

- A. Mustard
- B. Regular mayonnaise
- C. Butter

31. If you had to drink milk, which would you choose?

- A. 1% or skim milk
- B. 2% milk
- C. Whole milk

32. If you had to eat a quick breakfast, what would you choose?

- A. Poptarts
- B. None, I'd skip breakfast
- C. Piece of fruit

33. If you were making a sandwich, what type of bread would you use?

- A. White bread
- B. Potato bread
- C. 100% whole wheat bread

Section 5. Outcome Expectancies

"I'm now going to read to you some statements about food. Tell me whether the statement that I read is true, mostly true, mostly false, or false" (Do not read the "Don't know" response, but mark it if they give that answer. CIRCLE ONE RESPONSE.)

34. I would be healthier if I ate french fries three times a week instead of eating french fries seven days a week.

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

35. I would lose weight if I drink diet soda instead of regular soda.

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

36. I am more likely to get heart disease if I eat fried chicken instead of baked chicken.

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

37. I am more likely to get high blood pressure if I eat a lot of salty foods.

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

38. I will gain weight if I eat a lot of fatty foods (like potato chips).

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

39. I would have more energy if I ate more fruits and vegetables.

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

40. I will get diabetes if I eat a lot of sugary foods (like tasty cakes and ice cream).

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

41. I would have more energy to exercise or play sports if I ate more whole grains

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

42. I would feel better if I drank more water and less soda

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

43. I would feel better if I ate more fiber

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

44. I would be less likely to gain weight if I added less butter to my food

- A. True
- B. Mostly true
- C. Mostly false
- D. False
- E. (Don't know)

Section 6. Self-Efficacy

"I'm now going to ask you some questions about how sure you are that you can eat healthy foods. You can tell me if you know you can do it, you think you can do it, you're not sure you can do it, and you know that you can't do it. Remember that I am not asking if you do these things, only how sure you are that you can do it, given your everyday life" (CIRCLE ONE RESPONSE.)

45. I can eat vegetables several times a day.

- A. I know I can
- B. I think I can
- C. I'm not sure I can
- D. I know I can't

46. I can reduce the amount of potato chips that I eat to only one small bag a day.

- A. I know I can
- B. I think I can
- C. I'm not sure I can
- D. I know I can't

47. I can eat a bowl of low-sugar cereal for breakfast even when I am running late for school.

- A. I know I can
- B. I think I can
- C. I'm not sure I can
- D. I know I can't

48. I can drink sugar-free drinks like Crystal Light instead of fruit punch.
- A. I know I can
 - B. I think I can
 - C. I'm not sure I can
 - D. I know I can't
49. I can choose vegetables for a snack instead of potato chips or snack cakes, if I try hard enough.
- A. I know I can
 - B. I think I can
 - C. I'm not sure I can
 - D. I know I can't
50. I can eat at least one fruit everyday outside of school (fruit eaten at school doesn't count).
- A. I know I can
 - B. I think I can
 - C. I'm not sure I can
 - D. I know I can't
51. I can ask for low-fat mayonnaise or miracle whip on my sandwich.
- A. I know I can
 - B. I think I can
 - C. I'm not sure I can
 - D. I know I can't
52. I can buy fruit to snack on at the corner store.
- A. I know I can
 - B. I think I can
 - C. I'm not sure I can
 - D. I know I can't
53. I can buy baked chips instead of regular chips at the corner store.
- A. I know I can
 - B. I think I can
 - C. I'm not sure I can
 - D. I know I can't
54. I can try healthier side dishes at the fast food restaurants like having apples or yogurt instead of fries.
- A. I know I can
 - B. I think I can
 - C. I'm not sure I can
 - D. I know I can't

55. I can talk to my parents about buying me healthy snacks.

- A. I know I can
- B. I think I can
- C. I'm not sure I can
- D. I know I can't

56. I can make a sandwich on whole wheat bread versus white bread

- A. I know I can
- B. I think I can
- C. I'm not sure I can
- D. I know I can't

Section 7. Food Knowledge

"Now I'm going to ask you some questions about food. Please tell me which of the three foods listed is the better answer." (Do not read the "Don't know" response option, but mark it if they give that answer. CIRCLE ONE RESPONSE.)

Healthy breakfasts

57. Which breakfast cereal has less sugar?

- A. Froot Loops
- B. Rice Krispies
- C. Honey Nut Cheerios
- D. (Don't know)

58. Which breakfast has less fat?

- A. Oatmeal with fruit
- B. An omelet with bacon
- C. Poptarts
- D. (Don't know)

59. Which breakfast cereal has more fiber?

- A. Raisin Bran
- B. Lucky Charms
- C. Frosted Flakes
- D. (Don't know)

Cooking at home

60. What is the healthiest way to eat vegetables?

- A. Baby carrots with low fat dip
- B. Greens cooked with added butter
- C. Hash browned potatoes fried in a pan
- D. (Don't know)

61. What's the healthiest spread to put on a sandwich?

- A. Butter
- B. Mayonnaise
- C. Mustard
- D. (Don't know)

Healthy snacks

62. Which snack has less sugar?

- A. Tasty cake
- B. Cookie
- C. Granola Bar
- D. (Don't know)

63. Which snack has less salt?

- A. Pretzels
- B. Baby carrots
- C. Hot Cheetos
- D. (Don't know)

64. Which potato chip has less fat?

- A. Regular Utz potato chips
- B. Doritos
- C. Baked Utz chips
- D. Don't know

Carry-out foods

65. Which sandwich bread is healthier?

- A. 100% Whole wheat
- B. White bread
- C. Potato bread
- D. (Don't know)

66. Which fast food has less fat?

- A. Chinese egg roll
- B. Chicken box
- C. Turkey sub
- D. (Don't know)

67. Which side is lowest in fat?

- A. French fries
- B. Cooked greens
- C. Chips
- D. (Don't know)

Healthy beverages

68. Which soda has less sugar?

- A. Grape soda
- B. Coke
- C. Coke Zero
- D. (Don't know)

69. Which drink has less sugar?

- A. Red Bull (energy drink)
- B. Everfresh (fruit-flavored water)
- C. Snapple Diet half-and-half
- D. (Don't know)

70. Which milk has less fat?

- A. Whole milk
- B. Skim milk
- C. 2% milk
- D. (Don't know)

Section 8: Social Support Scale for Food and Physical Activity Habits

READ: Take a minute and think about ALL the people in your life you regularly see in the places you normally go (at home, school, rec center, church, etc.). Imagine you decided to make changes in your eating and physical activity habits. Would any of the people in your life support you or not? For each question, please tell me first, with a YES or NO, if there is someone in your life who would do that action. Then, tell me from a list of relationships (on supplement) who that person or persons are. You can choose ALL that apply. [Check YES or NO in Column A. Use supplement and check ALL that apply in Column B.]

QUESTION: Do you have someone in your life that.....?	YES or NO? <input checked="" type="checkbox"/> ONE ANSWER	What is their relationship to you? <input checked="" type="checkbox"/> ALL THAT APPLY
71.A. Talks to you about making improvements in your food and physical activity habits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent
		<input type="checkbox"/> Grandparent
		<input type="checkbox"/> Brother/Sister
		<input type="checkbox"/> Other family: _____
		<input type="checkbox"/> Friend
		<input type="checkbox"/> Mentor
		<input type="checkbox"/> Teacher/ Coach
		<input type="checkbox"/> Doctor/Nurse
		<input type="checkbox"/> Other

71.B. Encourages you to keep making healthy choices even when you don't feel like it?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other
71.C. Shows you how to make healthy choices by setting a good example?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other
71.D. Praises you about making changes in your diet and physical activity habits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other
71.E. Will be your buddy with making food and physical activity changes together?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other
71.F. Helps you solve problems that get in the way of your eating healthy and being active?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other

71.G. Tells you about new healthy foods and encourages you to try new healthy foods?	_____ Yes	____ Parent
		____ Grandparent
	_____ No	____ Brother/Sister
		____ Other family: _____
		____ Friend
		____ Mentor
		____ Teacher/ Coach
		____ Doctor/Nurse
	____ Other	

Section 9: Social Support for Healthy and Unhealthy Eating

READ: “Now I’m going to ask you some questions about how OFTEN your parent/ guardian may do certain things related to healthy and unhealthy eating. I’ll also ask you similar questions about how OFTEN your friends or other kids about your same age do certain things related to healthy and unhealthy eating. Tell me if you think these things happen never, rarely, sometimes, often, or very often.”

72. Parent support for healthy eating					
How often does your parent/guardian:	Never	Rarely	Some times	Often	Very Often
72.a. Give you ideas on how to eat healthier foods					
72.b. Offer you low-fat snacks					
72.c. Encourage you to stay away from high-fat foods or sweets					
72.d. Talk with you about eating more healthy foods					
73. Peer support for healthy eating					
How often do your friends or someone about your age:	Never	Rarely	Some times	Often	Very Often
73.a. Give you ideas on how to eat healthier foods					
73.b. Offer you low-fat snacks					
73.c. Encourage you to stay away from high-fat foods or sweets					
73.d. Talk with you about eating more healthy foods					
74. Parent support for unhealthy eating					

How often does your parent/guardian:	Never	Rarely	Some times	Often	Very Often
74.a. Offer you high-fat foods or sweets					
75.b. Encourage you to eat high-fat foods or sweets					
75.c. Say nice things about the sweet or high-fat foods you were eating					
75. Peer support for unhealthy eating					
How often do your friends or someone about your age:	Never	Rarely	Some times	Often	Very Often
75.a. Offer you high-fat foods or sweets					
75.b. Encourage you to eat high-fat foods or sweets					
75.c. Say nice things about the sweet or high-fat foods you were eating					

Section 10. Breakfast Consumption

76. In the past 7 days, how many days did you eat breakfast? (Breakfast includes a meal within 2-3 hours of waking, it does not have to be certain foods). Circle one:

- a. None
- b. One day in the last week
- c. Two days in the last week
- d. 3-4 days in the last week
- e. 5-6 days in the last week
- f. Everyday

77. What did you eat for breakfast yesterday? Record all foods and things added to foods, similar to a 24-hr recall.

Section 11. Anthropometry

“Finally, we’re going to see how tall you are and how much you weigh.”

Height: 1. ____ _/8 inches or ____ft ____ _/8 inches
2. ____ _/8 inches or ____ft ____ _/8 inches

Average of 1st 2 measurements: ____ _/8 inches

If different by more than 1/4th inch take 3rd measurement:

3. ____ _/8 inches or ____ft ____ _/8 inches

Average of all 3 measurements: ____ _/8 inches

Weight: 1. ____ _ lbs 2. ____ _ lbs

Average of 1st 2 measurements: ____ _ lbs

If different by more than 0.2 lbs take 3rd measurement:

3. ____ _ lbs

Average of all 3 measurements: ____ _ lbs

SELF-REPORTED (only in case of refusal to be measured)

Height _ ft. ____ in

Weight ____ _ lbs

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9




Think about every time you ate anything in the past week. You can tell us you didn't eat a food at all in the past week, or that you ate it one day last week, two days last week, 3-4 days, 5-6 days, or every day.

Page 2

Remember what you ate at home, at school, from fast food, or from a restaurant.

	HOW MANY DAYS LAST WEEK?							HOW MUCH IN ONE DAY?			
	NONE	1 DAY	2 DAYS	3-4 DAYS	5-6 DAYS	EVERY DAY					
Pancakes, waffles, Pop Tarts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many?	<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Granola bars, breakfast bars	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many?	<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Eggs or breakfast sandwiches like Egg McMuffins	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many eggs do you usually eat in 1 day?	<input type="radio"/> Just a bite	<input type="radio"/> 1 egg	<input type="radio"/> 2 eggs	<input type="radio"/> 3 eggs
Bacon or sausage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
Cooked cereal like oatmeal or grits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. Which bowl?	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
Cold cereal, like Corn Flakes, Frosted Flakes or any other kind	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. Which bowl?	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
When you ate cereal, which kind did you eat? (MARK THE ONE YOU ATE THE MOST OF)	<input type="radio"/> Sweet cereals like Frosted Flakes, Froot Loops <input type="radio"/> Plain cereals like Corn Flakes, Cheerios, Rice Krispies <input type="radio"/> Fiber cereals like Raisin Bran, Shredded Wheat <input type="radio"/> Fortified cereals like Total or Product 19										
How often do you have milk on cereal?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
Bananas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many do you usually have in 1 day?	<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Apples or pears	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many do you usually have in 1 day?	<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Oranges or Tangerines (Don't count juices)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many, in one day?	<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Strawberries or other berries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D

Remember what you ate at home, at school, from fast food, or from a restaurant.

	HOW MANY DAYS LAST WEEK?							HOW MUCH IN ONE DAY?				
	NONE	1 DAY	2 DAYS	3-4 DAYS	5-6 DAYS	EVERY DAY						
Applesauce, fruit cocktail or pineapple slices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. Which bowl?		<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D	
Any other fruit, like grapes, peaches, watermelon, cantaloupe, fruit roll-ups	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much do you usually eat?		<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
Hamburgers or cheeseburgers, at home or from a fast food restaurant	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much?		<input type="radio"/> 1/2 small burger	<input type="radio"/> 1 small burger	<input type="radio"/> 1 large burger	<input type="radio"/> 2 large burgers
Which kind do you usually eat?	<input type="radio"/> hamburgers <input type="radio"/> cheeseburgers											
Tacos, burritos or enchiladas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many?		<input type="radio"/> 1/2	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
Which kind of tacos, burritos, enchiladas do you usually eat?	<input type="radio"/> with meat or chicken <input type="radio"/> without meat or chicken											
Hot Pockets, meat ball subs or Sloppy Joes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
Roast beef, or steak	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much?		<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
Hamburger Helper, beef and noodles, beef stew, or any other beef dishes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much?		<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
Pork chops, ribs, or cooked ham	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much?		<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D
Fried chicken including chicken nuggets, from home or from a restaurant like KFC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many pieces?		<input type="radio"/> 1	<input type="radio"/> 2 (or 6 nuggets)	<input type="radio"/> 3	<input type="radio"/> 4
Any other kind of chicken, like roasted chicken, chicken stew, Chicken Helper	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much?		<input type="radio"/> A	<input type="radio"/> B	<input type="radio"/> C	<input type="radio"/> D

Remember what you ate at home, at school, from fast food, or from a restaurant.

	HOW MANY DAYS LAST WEEK?							HOW MUCH IN ONE DAY?			
	NONE	1 DAY	2 DAYS	3-4 DAYS	5-6 DAYS	EVERY DAY		1	2	3-4	5 or more
Tortillas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Margarine or butter, like on bread or on pancakes or on potatoes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many times each day ?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cheese. Remember cheese in sandwiches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many slices of cheese each day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mayonnaise or sandwich spread	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
Peanut butter sandwich	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many on those days?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jelly or jam	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
Sunflower seeds, peanuts or other nuts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much in one day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Salad with lettuce, green salad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. Which bowl?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Salad dressing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					
Green beans, string beans or peas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pinto beans, black beans, chili with beans, or <u>bean</u> burritos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

SERIAL #

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Remember what you ate at home, at school, from fast food, or from a restaurant.

	HOW MANY DAYS LAST WEEK?							HOW MUCH IN ONE DAY?			
	NONE	1 DAY	2 DAYS	3-4 DAYS	5-6 DAYS	EVERY DAY					
Corn or corn on the cob	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tomatoes including on salad	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Greens like collards, mustard greens or spinach	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Broccoli	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Carrots, carrot sticks or cooked carrots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sweet potatoes, or sweet potato pie	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
French fries, Tater Tots, hash browns or home fries	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Any other kind of potatoes, like mashed, baked or boiled	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Any other vegetables, like squash, cauliflower or green or red peppers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rice, including fried rice, Spanish rice, rice with beans	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ketchup, salsa, or barbecue sauce	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>					

Remember what you ate at home, at school, from snack machines, at the movies, or from fast food.

	HOW MANY DAYS LAST WEEK?							HOW MUCH IN ONE DAY?			
	NONE	1 DAY	2 DAYS	3-4 DAYS	5-6 DAYS	EVERY DAY		A	B	C	D
Snack chips like potato chips, tortilla chips, Doritos, popcorn, Bugles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much in the whole day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crackers, including snack crackers like Cheez-its, Ritz Bits, Goldfish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much in the whole day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Nachos with cheese	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How much?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice cream, ice cream bars or frozen yogurt	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	See pictures. Which bowl?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cookies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many cookies?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Donuts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many donuts?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cake, cupcakes, Tasty Cake, Ho-Ho's, Twinkies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many pieces?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pie, fruit pie, fruit crisp, cobbler	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many pieces?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chocolate candy, like candy bars, M&Ms, Reese's, Tootsie Roll	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many bars?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Any other candy (not chocolate), like Skittles, Starburst, Lifesavers, gum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many packages?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Chocolate milk, hot chocolate or cocoa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many glasses or cartons each day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Milk (not chocolate). (Don't count milk on cereal)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	How many glasses or cartons each day?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
What kind of milk do you usually drink?	<input type="radio"/> Whole milk <input type="radio"/> Reduced-fat (2%) milk <input type="radio"/> Low-fat (1%) milk <input type="radio"/> Non-fat milk <input type="radio"/> Lactaid milk <input type="radio"/> Don't know <input type="radio"/> Soy milk <input type="radio"/> Rice milk										

Remember what you ate at home, at school, from soda machines, at the movies, or from fast food.

HOW MANY DAYS LAST WEEK?

NONE 1 DAY 2 DAYS 3-4 DAYS 5-6 DAYS EVERY DAY

HOW MUCH IN ONE DAY?

1 2 3-4 5+

Sodas like Coke, Dr. Pepper, 7-Up, Sprite, Sunkist, Orange Crush. (Don't count diet sodas)

12 ounce can 20 ounce bottle more than 20 ounces

What size soda do you usually drink?

Slurpees, snow cones, popsicles (not ice cream)

Hawaiian Punch, Kool-Aid, Sunny Delight, Gatorade, ice tea, Snapple

Hi-C, Tang, Tampico, Mr. Juicy, Ssips punch

Real orange juice (Don't count Sunkist or other orange sodas)

Any other real fruit juices like apple juice or grape juice. (Remember juice boxes)

How many bottles or cans in 1 day?

How many glasses in 1 day?

How many glasses or juice boxes?

How many glasses or juice boxes?

How many glasses or juice boxes?

In the past week, did you take any vitamin pills, like One-a-Day or Flintstones?

No Yes

If yes, how many days last week?

1-2 3-4 5-6 7

Are you Male Female

How old are you?

How tall are you? Feet Inches

How much do you weigh? Pounds

Are you (Mark all that apply)

African American White Hispanic/Latino Asian American Indian, Alaska native Other

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TODAY'S DATE

MO. DAY YR.

0 1 2 3 4 5 6 7 8 9

AGE

0 1 2 3 4 5 6 7 8 9

0 1 2 3 4 5 6 7 8 9

WEIGHT

pounds

0 1 2 3 4 5 6 7 8 9

HEIGHT

ft. in.

0 1 2 3 4 5 6 7 8 9

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Appendix C:
Youth-leader Impact Questionnaire

Youth-leader Impact Questionnaire

DATE: ____/____/____ Data Collector: _____

Section 1. Demographic & Contact Information

71. Respondent ID #: _____

72. Respondent Name: _____

73. Respondent Date of Birth: _____ Age: _____

74. Respondent Sex (Circle): M F

75. Respondent Race (Check all that apply):

- ☐ American Indian/Alaskan Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian/Other Pacific Islander
- ☐ White
- ☐ Other: _____

76. Respondent Ethnic Background (Check):

- ☐ Hispanic or Latino
- ☐ Not Hispanic or Latino
- ☐ Other: _____

77. Street Address (Primary): _____

78. Email Address: _____

79. Alternate Email Address: _____

80. Phone Number: #1 _____ #2 _____ #3 _____

Type (i.e. mom's cell) #1 _____ #2 _____ #3 _____

81. Name of Caregiver: _____

82. Relationship of Caregiver to Participant: _____

83. Phone Number for Caregiver: _____

INTRODUCTION

“Before we begin, I want to give you some important information about this survey.

- This survey is about the foods that you buy. This means that I will ask you questions about times when you yourself had money and used it to buy food for yourself.
- All information collected will not be shared with anyone.
- There are no right or wrong answers.
- Telling us about the foods that you buy will help out kids your age in Baltimore eat healthier, so please be as honest as you can be.
- If you can’t remember or if a question seems odd, just ask me and I will explain ask well as I can.
- Thank you for your help.”

Section 1. Demographic & Contact Information (continued)

14. How many people live in your household? _____

15. Who do you live with? Please list relationships for each person in the household, as appropriate. (i.e. mother, father, sister, brother cousin, roommate, etc.)

16. What is the highest level of education that you have completed? Please specify:

17. Are you currently employed? (Check ONE response.)

Yes ☐

Student ☐

No ☐

Other ☐

If Other, specify:

18. If yes to previous Question, what is your employment status? (Check only ONE response.)

Full-time ☐

Part-time ☐

Seasonal/occasional ☐

High School Student ☐

Full-time college student..... ☐

Part-time college student..... ☐

Unemployed ☐

Other ☐

If Other, specify: _____

19. Socioeconomic Status Measures

19a. Material Style of Life. How many of the following do you, or someone in your household, own in working condition? (Place a number before each item, including 0 (Zero))

- _____ Big Screen TV (52")
- _____ Other TV
- _____ DVD/ Blu Ray player
- _____ Computer
- _____ MP3 player
- _____ Video game console (xbox, playstation, etc)
- _____ Cellular Phone, Is it a smart phone? Yes No
- _____ Washer
- _____ Dryer
- _____ Car

19b. What is the highest level of education achieved by your parent/guardian?

- Less than 6th grade.....☐
- 6th grade☐
- 7th grade.....☐
- 8th grade.....☐
- 9th grade☐
- 10th grade.....☐
- 11th grade☐
- High school (12th grade).....☐
- GED... ..☐
- <2 yrs college.....☐
- Associate's degree.....☐
- Bachelor's degree.....☐
- Graduate school.....☐
- Vocational school.....☐
- Other.....☐

If Other, specify: _____

19c. Approximately what is the income level of your parent/guardian?

Respondent can point to the appropriate answer.

0-10,000..... ☐

10,001-20,000..... ☐

20,001-30,000..... ☐

30,001-40,000..... ☐

40,001-50,000..... ☐

50,001-60,000..... ☐

60,001-70,000..... ☐

70,001-80,000..... ☐

80,001+..... ☐

Declined to answer... ☐

Section 2. Food Purchases

“First we are going to talk about times when you have bought food for the people whom you live with.” (Read each answer choice. CIRCLE ONLY ONE RESPONSE.)

20. How do you help with food shopping for your household?

- a. I never shop for food for my household.
- b. I go with the main food shopper on most trips to the food store (more than 50% of trips to the food store).
- c. I go with the main food shopper on some trips to the food store (less than 50% of trips to the food store).
- d. I sometimes do the food shopping for my household without an adult.
- e. I do all or most of the food shopping for my household without an adult.
- f. Other (please specify):

“I’m going to ask you some questions about when you buy food for yourself. I am only interested in times when you spend money on food for yourself. [You can include foods that you might buy for others that you eat too. Please don’t include foods that others bought for you.]”

21. Think about all the places where you bought food during the last 7 days, from last ____ to _____. What are the all places that you shop in each category? [If child shops at less than 3 stores in a category mark the column “I do not shop at this type of food source” in each column for which there is not a response. Where are they located? How often did you shop there in the last 7 days? If child shops in more than 3 of any type of food source mark source type and name in extra rows that follow.]

Food Source Type & Name	Times patronized in the last 7 days (If did not shop there, mark as zero)	Address/Store code for each food source	Who was with you on MOST trips to this place? Circle one.
Supermarket / Grocery Store			
1.			Friend Family: _____ Alone Other: _____
2.			Friend Family: _____ Alone Other: _____
3.			Friend Family: _____ Alone Other: _____
Corner store			
1.			Friend Family: _____ Alone Other: _____
2.			Friend Family: _____ Alone Other: _____
3			Friend Family: _____ Alone Other: _____
Convenience store (i.e. 7-11)			
1.			Friend Family: _____ Alone Other: _____
2.			Friend Family: _____ Alone Other: _____
3.			Friend Family: _____ Alone Other: _____
Fast food restaurant/ carry-out			
1.			Friend Family: _____ Alone Other: _____
2.			Friend Family: _____ Alone Other: _____
3.			Friend Family: _____ Alone Other: _____
School cafeteria/ rec center			
1.			Friend Family: _____ Alone Other: _____
2.			Friend Family: _____ Alone Other: _____
3.			Friend Family: _____ Alone Other: _____

Food Source Type & Name	Times patronized in the last 7 days (If did not shop there, mark as zero)	Address/Store code for each food source	Who was with you on MOST trips to this place? Circle one.
Other (e.g., church, pantry, food truck, arabber, drug store)			
1.			Friend Family: _____ Alone Other: _____
2.			Friend Family: _____ Alone Other: _____
3.			Friend Family: _____ Alone Other: _____
EXTRA: Type and name of categories with more than three places Ex: 'Carryout : Jo's Lake Taco's'			
1.			Friend Family: _____ Alone Other: _____
2.			Friend Family: _____ Alone Other: _____
3.			Friend Family: _____ Alone Other: _____
4.			Friend Family: _____ Alone Other: _____
5.			Friend Family: _____ Alone Other: _____
6.			Friend Family: _____ Alone Other: _____

22. Now I want to get an idea of how often you buy some foods. Please think back over the last 7 days, from last ____ to _____. I'm going to name some foods, and I want you to count for me the number of times **you bought** them for **yourself** in the last 7 days. [You can include foods that you might buy for others that you eat too. Please don't include foods that others bought for you.] I will also ask you where you bought them most of the time.

(Read one food item, and ask how many times they bought the food in the last 7 days. Write down the # in the first column. Ask where they bought it most often, and read aloud the food sources. Put a check mark (✓) in ONE column.)

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
Beverage							
Regular soda (include Grape Soda) (Brand(s): _____)							
Diet soda (include Coke Zero, Sprite Zero, Dr. Pepper 10, Pepsi Next)(Brand(s): _____)							
Fruit punch or Hugs fruit drink							
100% Fruit juice (Like Juicy Juice, Welch's)(Brand(s): _____)							
Plain Water							
Fruit flavored water (Brand(s): _____)							
Sugar free drink mixes (like Crystal Light)							
Whole milk							
2% milk							
1% or skim milk							
Sports drinks (Gatorade)							
Sweetened iced tea/ Half and half							
Unsweetened tea/ Diet half & half							
Energy drinks (Monster, Red Bull)							
Any other drinks (Type: _____)							

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
Fruit & Vegetables							
Apples							
Applesauce							
Bananas							
Oranges							
Other fresh fruit (Type: _____)							
Frozen fruit (Type: _____)							
Canned fruit/ Fruit cups							
Dried fruit (like raisins)							
Baby carrots (with or without dip)							
Celery (with or without dip)							
Cucumber (with or without dip)							
Other fresh/frozen vegetables (Type: _____)							
Canned vegetables							
Any other fruit or vegetables (Type: _____)							
Whole Grains/ Grocery Items							
White bread							
100% Whole wheat bread							
Sugary cereal (like Froot Loops, Cap'n Crunch) Brand(s): _____)							
Low sugar cereal (like cheerios, rice krispies) Brand(s): _____)							
High Fiber Cereal (like Shredded wheat, bran flakes) Brand: _____)							
Hot cereal (oatmeal, grits)							
Tuna (canned)							
Cooking spray							
Any other groceries (Type: _____)							

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
Fast Food							
Hamburger or Cheeseburger							
Pizza							
Fried chicken (include Chinese fried chicken wings)							
Grilled chicken							
Fried seafood (fish, shrimp, etc.)							
Grilled seafood							
French fries or tater tots (include cheese fries)							
Fruit side dish (Type: _____)							
Vegetable side dish (include green salad) (Type: _____)							
Subs/sandwiches/wraps (like cheesesteaks, fried chicken or fish sandwiches) Type: _____							
Subs/sandwiches/wraps (sliced deli meat) Type: _____							
Chinese food							
Tacos/burritos/nachos/quesadilla							
Any other carry-out food (Type: _____)							
Any other carry-out food (Type: _____)							
Any other carry-out food (Type: _____)							
Snacks							
Chips or cheese curls (Type(s): _____)							
Baked chips (Type(s): _____)							
Reduced-fat chips (like R.F. Doritos) (Brand: _____)							
Pretzels							
Dried fruit, nuts or seeds (like sunflower seeds)							
Baked goods (cookies, snack							

Food item	# times purcha- sed in the last 7 days	Where did you usually buy this food?					
		Supermarket	Convenience Store	Corner Store	Fast Food/ Carry-Out	School/ Rec Center	Other (write place)
cakes, donuts, poparts)							
Yogurt							
Granola bars (like Quaker)							
Chocolate candy (like snickers, hershey's, M&M's)							
Other candy (like Skittles, gummy bears, life savers)							
Ice cream							
Juice popsicles							
Snow cones or snow balls							
Any other Snacks (Type _____)							

23. How much money do you usually spend when you go to the corner store or convenience store? _____dollars per visit

24. How much money do you usually spend when you go to the carry out or fast food restaurant? _____dollars per visit

Section 3. Food Preparation Environment

“Now I am going to ask you some questions about what kinds of food you eat at home. Think back over the past 7 days, from last ___ to ___.”

25. In the past 7 days, how often did a member of your household prepare food for you?

- G. Never
- H. 1 time per week
- I. 2-3 times per week
- J. 4-6 times per week
- K. 1 time per day
- L. 2 or more times per day

26. In the past 7 days, how often did you prepare food for yourself or others (including making yourself lunch)?

- G. Never (***if never, skip to question #22***)
- H. 1 time per week
- I. 2-3 times per week
- J. 4-6 times per week
- K. 1 time per day
- L. 2 or more times per day

27. You said that you prepared food ____ (read # of times from question #20). What foods did you prepare? (**Write each food item in the left column, one item per row.**) In the last 7 days, how did you prepare ____ (Read each food item separately, and leave open-ended. Put a check mark (✓) in each applicable column for preparation method.) Record if anything was added to the food.

FOOD (write one item per row)	PREPARATION METHOD					What was added (write out)
	Fried (deep or pan)	Baked (or toasted)	Micro waved	Not cooked (like cereal)	Other (specify: grilled, broiled)	

Section 4. Intentions about Foods

"I am going to read a statement and three food choices. Please tell me which food you would really choose to eat, given your life right now.

(CIRCLE ONLY ONE RESPONSE)

28. If you wanted a snack, which would you pick?
- D. Potato chips
 - E. Pretzels
 - F. Yogurt
29. If you were thirsty, which would you choose for a drink?
- D. Soda
 - E. Fruit-flavored water
 - F. Plain water
30. If you had to eat cereal, which would you choose?
- D. Rice Krispies
 - E. Honey Nut Cheerios
 - F. Froot Loops
31. The next time you want a salty snack, which would you choose?
- D. Sunflower seeds
 - E. French fries
 - F. Chips
32. If you had to eat at a fast food restaurant or carryout, which meal would you choose?
- D. Burger (regular or cheese)
 - E. Turkey sub
 - F. Fried chicken
33. If you had to eat a vegetable, which would you choose?
- D. Baby carrots
 - E. Corn
 - F. Potatoes
34. If you had to drink a fruit beverage, which would you choose?
- a. Crystal Light (sugar-free drink mix)
 - b. Fruit punch (including Hugs)
 - c. Fruit flavored soda (like orange or grape soda)
35. If you had to choose a fruit snack, which would you choose?
- a. Apple with caramel dip
 - b. Grapes
 - c. Fruit roll-up

36. The next time you make eggs, what would you use to cook them?
- a. Cooking spray
 - b. Vegetable oil
 - c. Margarine, butter, shortening
37. If you had to drink milk, which would you choose?
- a. 1% or skim milk
 - b. Soy milk
 - c. Whole milk
38. If you had to eat a quick breakfast, what would you choose?
- a. Poptarts
 - b. None, I'd skip breakfast
 - c. Piece of fruit
39. If you were making a sandwich, what type of bread would you use?
- a. White bread
 - b. Potato bread
 - c. 100% whole wheat bread

Section 5. Outcome Expectancies

"I'm now going to read to you some statements about food. Tell me whether the statement that I read is true, mostly true, mostly false, or false"
(Do not read the "Don't know" response, but mark it if they give that answer. CIRCLE ONE RESPONSE.)

40. I would be healthier if I ate french fries three times a week instead of eating french fries seven days a week.
- F. True
 - G. Mostly true
 - H. Mostly false
 - I. False
 - J. (Don't know)
41. I would lose weight if I drink diet soda instead of regular soda.
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)

42. I am more likely to get heart disease if I eat fried chicken instead of baked chicken.
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)
43. I am more likely to get high blood pressure if I eat a lot of salty foods.
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)
44. I will gain weight if I eat a lot of fatty foods (like potato chips).
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)
45. I would have more energy if I ate more fruits and vegetables.
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)
46. I will get diabetes if I gain a lot of weight.
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)
47. I would have more energy to exercise or play sports if I ate more whole grains
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)

48. I would feel better if I drank more water and less soda
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)
49. I would feel better if I ate more fiber
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)
50. I would be less likely to gain weight if I added less butter to my food
- a. True
 - b. Mostly true
 - c. Mostly false
 - d. False
 - e. (Don't know)

Section 6. Self-Efficacy

"I'm now going to ask you some questions about how sure you are that you can eat healthy foods. You can tell me if you know you can do it, you think you can do it, you're not sure you can do it, and you know that you can't do it. Remember that I am not asking if you do these things, only how sure you are that you can do it, given your everyday life" (CIRCLE ONE RESPONSE.)

51. I can eat vegetables several times a day (Potatoes don't count).
- E. I know I can
 - F. I think I can
 - G. I'm not sure I can
 - H. I know I can't
52. I can reduce the amount of chips that I eat to only one small bag a day.
- a. I know I can
 - b. I think I can
 - c. I'm not sure I can
 - d. I know I can't
53. I can regularly eat low sugar cereal (like cheerios) for breakfast and snacks instead of high sugar cereal like Frosted Flakes, or Honey Nut Cheerios.
- a. I know I can
 - b. I think I can
 - c. I'm not sure I can
 - d. I know I can't

54. I can eat a healthy breakfast even when I am running late for school or work.

- a. I know I can
- b. I think I can
- c. I'm not sure I can
- d. I know I can't

55. I can drink sugar-free drinks like water, Crystal Light, or diet soda instead of high sugar drinks like fruit punch, half and half, or regular soda

- a. I know I can
- b. I think I can
- c. I'm not sure I can
- d. I know I can't

56. I can eat more fruit and vegetables for a snack and avoid fatty snacks (like potato chips and candy) if I try hard enough.

- a. I know I can
- b. I think I can
- c. I'm not sure I can
- d. I know I can't

57. I can eat fruit everyday outside of school (fruit eaten at school doesn't count).

- a. I know I can
- b. I think I can
- c. I'm not sure I can
- d. I know I can't

58. I can use cooking spray (like Pam) instead of butter, margarine or oil when cooking food.

- a. I know I can
- b. I think I can
- c. I'm not sure I can
- d. I know I can't

59. I can buy fruit to snack on at the corner store.

- a. I know I can
- b. I think I can
- c. I'm not sure I can
- d. I know I can't

60. I can buy baked chips instead of regular chips at the corner store.

- a. I know I can
- b. I think I can
- c. I'm not sure I can
- d. I know I can't

61. Try healthier side dishes at the fast food restaurants like having apples or yogurt instead of fries.
- a. I know I can
 - b. I think I can
 - c. I'm not sure I can
 - d. I know I can't
62. I can reduce the number of times I buy fast food or carry-out food in a week.
- a. I know I can
 - b. I think I can
 - c. I'm not sure I can
 - d. I know I can't
63. I can make a sandwich on 100% whole wheat bread versus white bread
- a. I know I can
 - b. I think I can
 - c. I'm not sure I can
 - d. I know I can't

Section 7. Food Knowledge

"Now I'm going to ask you some questions about food. Please tell me which of the three foods listed is the better answer." (Do not read the "Don't know" response option, but mark it if they give that answer. CIRCLE ONE RESPONSE.)

Healthy breakfasts

64. Which breakfast cereal has less sugar?
- E. Frosted Flakes
 - F. Rice Krispies
 - G. Honey Nut Cheerios
 - H. (Don't know)
65. Which breakfast has less fat?
- a. Oatmeal with fruit
 - b. An omelet with bacon
 - c. Poptarts
 - d. (Don't know)
66. Which breakfast cereal has more fiber?
- E. Raisin Bran
 - F. Lucky Charms
 - G. Cheerios
 - H. (Don't know)

Cooking at home

67. What is the healthiest way to eat vegetables?
- a. Baby carrots with low fat dip
 - b. Greens cooked with added butter
 - c. Hash browned potatoes fried in a pan
 - d. (Don't know)
68. Which of the following adds the least amount of fat when cooking?
- a. Vegetable oil
 - b. Butter or margarine
 - c. Cooking spray
 - d. (Don't know)
69. What's the healthiest spread to put on a sandwich?
- a. Butter
 - b. Mayonnaise
 - c. Mustard
 - d. (Don't know)

Healthy snacks

70. Which snack has less sugar?
- A. Tasty cake
 - B. Cookie
 - C. Granola Bar
 - D. (Don't know)
71. Which potato chip has less fat?
- a. Regular Utz potato chips
 - b. Doritos
 - c. Baked Utz chips
 - d. Don't know

Carry-out Foods

72. Which sandwich bread is healthier?
- E. 100% Whole wheat
 - F. White bread
 - G. Potato bread
 - H. (Don't know)
73. Which carry-out food has less fat?
- E. Chinese egg roll
 - F. Chicken box
 - G. Turkey sub
 - H. (Don't know)

74. Which fast food is healthier?
- a. Burger with fries
 - b. Chef salad with ranch dressing
 - c. Grilled chicken and baked potato
 - d. (Don't know)

75. Which side is lowest in fat?
- a. French fries
 - b. Cooked greens
 - c. Potato salad (with mayo)
 - d. (Don't know)

Healthy beverages

76. Which fruit drink has less sugar?
- E. 100% juice
 - F. Sunny Delight
 - G. Crystal light fruit punch drink mix
 - H. (Don't know)

77. Which of these drinks has less sugar?
- I. Red Bull (energy drink)
 - J. Everfresh (fruit-flavored water)
 - K. Snapple Diet half-and-half
 - L. (Don't know)

78. Which milk has less fat?
- E. Whole milk
 - F. Skim milk
 - G. 2% milk
 - H. (Don't know)

Section 8: Social Support Scale for Food and Physical Activity Habits

READ: Take a minute and think about ALL the people in your life you regularly see in the places you normally go (at home, school, rec center, church, etc.). Imagine you decided to make changes in your food related and physical activity habits. Would any of the people in your life support you or not? For each question, please tell me first, with a YES or NO, if there is someone in your life who would do that action. Then, tell me from a list of relationships (on supplement) who that person or persons are. You can choose ALL that apply. [Check YES or NO in Column A. Use supplement and check ALL that apply in Column B.]

QUESTION: Do you have someone in your life that.....?	YES or NO? <input checked="" type="checkbox"/> ONE ANSWER	What is their relationship to you? <input checked="" type="checkbox"/> ALL THAT APPLY
79.A. Talks to you about making improvements in your food and physical activity habits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other: _____
79.B. Encourages you to keep making healthy choices even when you don't feel like it?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other: _____
79.C. Shows you how to make healthy choices by setting a good example?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other: _____
79.D. Praises you about making changes in your diet and physical activity habits?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher/ Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other: _____
79.E. Will be your buddy or partner in making food and physical activity changes together?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher / Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other: _____
79.F. Helps you solve problems that get in the way of your eating healthy		<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent

and being active?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher / Coach <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other: _____
79.G. Tells you about new healthy foods and encourages you to try new healthy foods?	<input type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Parent <input type="checkbox"/> Grandparent <input type="checkbox"/> Brother/Sister <input type="checkbox"/> Other family: _____ <input type="checkbox"/> Friend <input type="checkbox"/> Mentor <input type="checkbox"/> Teacher <input type="checkbox"/> Doctor/Nurse <input type="checkbox"/> Other: _____

Section 9: Social Support for Healthy and Unhealthy Eating

READ: "Now I'm going to ask you some questions about how OFTEN your parent/ guardian may do certain things related to healthy and unhealthy eating. I'll also ask you similar questions about how OFTEN your friends or other kids about your same age do certain things related to healthy and unhealthy eating. Tell me if you think these things happen never, rarely, sometimes, often, or very often."

80. Parent support for healthy eating					
How often does your parent/guardian:	Never	Rarely	Some times	Often	Very Often
80.a. Give you ideas on how to eat healthier foods					
80.b. Offer you low-fat snacks					
80.c. Encourage you to stay away from high-fat foods or sweets					
80.d. Talk with you about eating more healthy foods					
81. Peer support for healthy eating					
How often do your friends or someone about your age:	Never	Rarely	Some times	Often	Very Often
81.a. Give you ideas on how to eat healthier foods					
81.b. Offer you low-fat snacks					
81.c. Encourage you to stay away from high-fat foods or sweets					
81.d. Talk with you about eating more healthy foods					

82. Parent support for unhealthy eating					
How often does your parent/guardian:	Never	Rarely	Some times	Often	Very Often
82.a. Offer you high-fat foods or sweets					
82.b. Encourage you to eat high-fat foods or sweets					
82.c. Say nice things about the sweet or high-fat foods you were eating					

83. Peer support for unhealthy eating					
How often do your friends or someone about your age:	Never	Rarely	Some times	Often	Very Often
83.a. Offer you high-fat foods or sweets					
83.b. Encourage you to eat high-fat foods or sweets					
83.c. Say nice things about the sweet or high-fat foods you were eating					

Section 10. Breakfast Consumption

84. In the past 7 days, how many days did you eat breakfast? (Breakfast includes a meal within 2-3 hours of waking, it does not have to be certain foods). Circle one:

- a. None
- b. One day in the last week
- c. Two days in the last week
- d. 3-4 days in the last week
- e. 5-6 days in the last week
- f. Everyday

85. What did you eat for breakfast yesterday? Record all foods and things added to foods, similar to a 24-hr recall.

Section 11. Health Beliefs and Attitudes

I am going to read you some statements. I'd like you to tell me how strongly you agree or disagree with each statement by choosing one of the following responses.

86. Healthy Foods	Strongly Disagree	Disagree	Un-decided	Agree	Strongly Agree
86.a. Healthy foods are expensive.					
86.b. Making a healthy dinner takes too much time.					
86.c. Preparing and eating healthy foods is important to me.					
86.d. I don't buy healthy foods at corner stores because they are not available.					
86.e. I cannot afford to eat healthy foods.					
86.f. Healthy foods are tasteless.					
86.g. Making a healthy dinner is expensive.					
86.h. Healthy foods are not convenient to make.					
86.i. I think a lot about what I eat.					

Section 12. Youth-leader Skills. Please rate how confident you are doing the following things.

87. Youth Leader-Skills	Very Confident	Confident	Somewhat Confident	Not at all Confident
87.a. How confident are you that you could talk to kids about eating healthier?				
87.b. How confident are you that you can work with your youth-leader team to plan and get ready to present to kids in the rec center?				
87.c. How confident are you that you could think of lots of different ways to solve a problem if the session you are delivering doesn't go as you planned?				
87.d. How confident are you that you could handle it if two kids you were teaching got in an argument?				
87.e. How confident are you that you could help a child choose a healthy snack at a corner store?				
87.f. How confident are you that know what to do if people are teasing /making comments about another persons eating habits, weight, or body size.				
87.g. How confident are you that you could teach a child how to cook a healthy meal at home?				
87.h. How confident are you that you can get a group of kids to follow directions for a complex game?				
87.i. How confident are you that you can get someone to stop if they are annoying you or disrespecting you while you are trying to talk?				
87.j. How confident are you that you can keep kids focused and on task, even when they don't want to listen.				
87.k. How confident are you that you can show kids how to be healthy by setting a good example in your own life?				
87.l. How confident are you that you could convince someone to drink water instead of fruit punch?				
87.m. How confident are you that can get along well with your teammates in delivering the rec center program for BHCK?				
87.n. How confident are you that you will be able to lead the BHCK intervention with youth ages 10-14?				

Section 14. Anthropometry

Height: 1. ____ ____ /8 inches

2. ____ ____ /8 inches

Average of 1st 2 measurements: ____ ____ /8 inches

If different by more than 1/4th inch take 3rd measurement:

3. ____ ____ /8 inches

Average of all 3 measurements: ____ ____ /8 inches

Weight:

1. ____ . ____ lbs

2. ____ . ____ lbs

Average of 1st 2 measurements: ____ . ____ lbs

If different by more than 0.2 lbs take 3rd measurement:

3. ____ . ____ lbs

Average of all 3 measurements: ____ . ____ lbs

SELF-REPORTED (only in case of refusal to be measured)

Height ____ ft. ____ in

Weight ____ . ____ lbs

[illegible]

BHCK GIFT CARD RECEIPT

I received a \$___gift card (s) (#_____, _____)
for the (_____) store from data collector
(Name: _____) as a gift for completing the
data form(s).

Signed: _____ Date: _____
Respondent signature

Respondent name printed

Appendix D:
Recreation Center Curriculum Excerpts

UNIT 1: BEVERAGES

LESSON 2: STOPLIGHT BEVERAGES

EDUCATIONAL ACTIVITY STATION

Learning Objectives:

1. Participants will be able to state why they should avoid sugary beverages
2. Participants are able to identify drinks that they can drink: anytime they are thirsty, sometimes (like 1-2 times per day) or rarely (1-2 times per week).

Materials:

- Empty plastic beverage containers (water, milk (all varieties), 100% juice, crystal light, chocolate milk, pop, fruit punch, fruit soda)
- **Number of Leaders Needed:** 1 or more

Instructions:

Greeting & Ice breaker of your choice (5 minutes)

List icebreaker: _____

Opening Discussion Topics (7 minutes)

1. Question: Does anyone remember what we talked about the last time we were here?

(Pause for responses) **Answer:** We talked about drinks! And how some drinks are better for us than others.

2. Question: Does anyone remember why some drinks are better for you than others?

Answer: Some drinks have lots of sugar in them, which makes them not good for you.

3. Question: Does anyone know why we should avoid drinks with lots of sugar?

Answer: They give you quick energy, but then you can have a sugar CRASH, they can give you cavities, if you drink them all the time they can make you gain weight.

5. Questions: What do the colors on a stoplight mean? What does green mean? What does yellow mean? What does red mean?

Answer: Green means go, yellow means be careful, and red means stop.

You can think of a stoplight to help you choose what drink to drink.

GREEN drinks are things you can drink **any time!**

Question: What do you think are examples of GREEN drinks?

GREEN drinks are drinks that don't have any sugar, or that have just a little bit of sugar and lots of nutrients. GREEN drinks are water and low fat milk. You can drink water and low fat milk anytime you want something to drink.

YELLOW drinks are drinks you should drink **sometimes, like 1-2 times per week.**

Question: What drinks would be YELLOW drinks?

Yellow drinks are part healthy, and part unhealthy too. For example, 100% fruit juice is healthy because it has vitamins in it, but it has sugar too- so you should only drink every now and then. Yellow drinks are things like 100% fruit juice, diet soda, crystal light, 2% or whole milk, and low sugar fruit drinks (like reduced sugar Hugs).

RED drinks are drinks that you should drink rarely, which means that you shouldn't have them too often, like 1-2 times per week.

Question: What drinks would be RED drinks?

RED drinks have lots of sugar and no vitamins. These are the drinks that can cause the negative affects of having too much sugar. Does anyone remember what those are? (sugar crash, weight gain, cavities). RED drinks are things like regular soda, half and half (half iced tea and half lemonade), triple mix (1/3 iced tea, 1/3 fruit punch, 1/3 lemonade), fruit punch, sunny delight, orange soda, big bursts.

A lot times people want to make a healthy choice, but it's hard to know what is healthy. One way to help you decide what is healthy is to think about a stoplight, and pick GREEN drinks like water most of the time.

Who is up for a challenge? We've got a big box of all different types of drinks, and your job is to help divide them up as GREEN, YELLOW, or RED drinks. So pick a drink and see if you can tell where it belongs.

Activity (7 minutes)

Set up:

Place the Green, yellow, red stoplight signs on the walls from three different corners of the room (if the group is acting rowdy, bring the containers in close so the group is closer together and more under control).

Instructions:

1. Explain what the signs represent.
 - a. *GREEN* sign—Water and low fat milk are green drinks, you can drink these drinks as often as you want to
 - b. *YELLOW* sign—Yellow drinks are like diet soda, and fruit juice, you can drink these drink about 1-2 per day
 - c. *RED* sign-- drink these drinks rarely (like 1-2 per week), as they are high in sugar with little nutrients
2. Give each participant a beverage container from the kit.
3. Ask participants to decide which sign (green, yellow, red) their beverages

belongs to.

4. Have participants take turns bringing the beverage container to their choice of corner. Be creative! They can walk, skip, or jump to the corner!
5. Reveal the correct choice.
6. If it is correct, ask the participant to place the container underneath the sign and walk, skip or jump away.
7. If it is at the wrong place, encourage participants to walk, skip or jump to the correct corner. Place the container underneath the sign, then walk, skip or jump away.
8. After all the kids have gone, review which categories that the kids actually placed the drinks in compared to the green, red, and yellow categories listed below. Correct and discuss any mistakes. Also, remind participants of how often they are supposed to drink each type of drink. Green is fine anytime you are thirsty. Yellow drinks sometimes, like once per day. Red drinks you should have rarely like 1-2 times per week.

	Green	Yellow	Red
Message:	Anytime You're Thirsty (during the day)	Sometimes (only 1 per day)	Rarely (<1-2 days/ week)
Drinks:	Water Skim/1% Milk	Crystal Light 100% Fruit Juice Low Sugar Soda 2%/Whole Milk Low sugar Fruit Drinks	Soda Fruit Drinks (Fruit Punch) Fruit-flavored soda Sunny D

Modified from: Sugar Shocker Curriculum

<http://www.capitalhealth.ca/NR/rdonlyres/e6nstouxulgpkbvzot7as7dhtyv6storxwnl57sbz4gl6o2im2rgwio4tthag2r5vag2aoqodp7fst6zyagrafdccb/Sugar+shocker.pdf>

EXPERIENTIAL LEARNING ACTIVITY STATION (30 minutes)

Materials:

- 30 Empty plastic beverage containers
- 3 Rubber balls
- Score sheet poster
- **Number of Leaders Needed:** 3 or more

Setup:

- Plastic beverage bottles are collected
- All bottles are color-coded according to their classification as green, yellow or red drinks by spray painting the tops of the bottles with their corresponding color.
- Set-up mini bowling lanes. Each lane should have a variety of green, red, and yellow drink bottles arranged like bowling pins

Instructions:

- Mini bowling lanes are set up and youth are assigned to a bowling lane (depending on the number of kids participating, organize kids into teams.). If teams are used, allow youth to create names for their teams. Write the name of the teams on the top of the score sheet.
- Two peer-leaders will be assigned to each bowling “lane”, one to set up the ‘pins’ and keep score, the other to direct children in bowling. If you need extra help you can assign one or more of the kids to help reset the ‘pins’.
- Kids get points by knocking down pins with healthy beverages. Green drinks get 3 points, yellow drinks get 1 point, and red drinks 0 points. (i.e. water, low-fat milk = 3 points; chocolate milk, 100% juice = 1 point; Soda, fruit drinks, sweetened tea = 0 points).
 - If this version is too easy, you can vary the points to make it harder. For example, change it so that you LOSE 1 point if you knock down a red drink (points for yellow and green drinks stay the same). Then set up the drinks by color so that the kids can “aim” to avoid the red drinks.
- The bowling team with the highest number of points at the end of the game wins a prize!

Modified from: Harvard SPH, Food & Fun Afterschool Curriculum. Unit 3 Sugar Sweetened Drinks: Be Sugar Smart!

http://www.hsph.harvard.edu/prc/files/2012/11/unit_3_besugarsmart.pdf

UNIT 2: SNACKS

LESSON 4: STOPLIGHT SNACKS

EDUCATIONAL ACTIVITY STATION

Learning Objectives:

1. Participants are able to identify snacks that should be eaten: anytime they are hungry, sometimes (like 1-2 times per day), or rarely (1-2 times per week).
2. Participants will be able to advocate for healthier foods in their neighborhood

Materials:

- Empty bags of chips, granola bars, plastic models of fruits/vegetables, cookies, sunflower seeds
- GREEN, YELLOW, RED signs
- Tape
- Pictures of snacks (apples, carrots with dressing for dip, chips, pretzels, ice cream, popcorn, whole-wheat crackers, peanut butter and bread, yogurt)
- 30 pieces of paper
- 30 envelopes
- 30 Pencils
- **Number of Leaders Needed:** 1 or more

Instructions:

Greeting & Ice breaker of your choice (5 minutes)

List icebreaker: _____

Opening Discussion (10 minutes)

Place the green, yellow, red stoplight signs on the walls from three different corners of the room (if the group is acting rowdy, bring the containers in close so the group is closer together and more under control).

Question: Who can remember what we talked about last time?: Snacks! For the last couple of weeks, we have been talking about snacks. We've learned that snacks are important, and there are some snacks that are better for you than other snacks.

Before we talked about snacks, we talked about drinks. A few weeks ago when we were talking about drinks we talked about a way to pick drinks that were better for you. **Does anyone remember the easy way to pick out drinks? (If no one remembers, provide the hint: this way also tells you when to go and stop when driving your car.)**

Yes, you can use a stoplight to help you pick drinks, you can also use a stoplight to help you pick snacks. There are three types of snacks, same as the three colors on a stoplight: **GREEN, YELLOW, and RED.**

GREEN light snacks are snacks that you can eat anytime you are hungry.

Question: What do you think are examples of GREEN snacks?

The GREEN light sign means eat these snacks often, as they are full of nutrients and will give you lots of energy. Go snacks include fruits (apples, bananas, grapes, watermelon, oranges, etc.) and vegetables (carrots and dip, celery, cucumbers, etc.).

YELLOW light snacks are snacks that you can eat sometimes, like 1-2 times per day.

Question: What do you think are examples of YELLOW snacks?

The YELLOW light sign means eat these snacks less often, as they are nutritious but have more sugar and fat. Yellow snacks include baked chips, pretzels, granola bars, nuts and seeds.

RED light snacks are snacks that you can eat rarely, like 1-2 per week.

Question: What do you think are examples of RED snacks?

The RED light sign means eat these snacks sometimes, as they are high in sugar and fat with little nutrients and may lead to a “sugar crash.” Red snacks include chips, snack cakes, candy bars and cookies.

Now let’s see if you’re able to classify snacks as either a “GREEN” snack, a “YELLOW” snack, or a “RED” snack.

1. Give each participant a snack from the kit.
2. Ask participants to decide which sign their snack belongs to.
3. Have participants take turns bringing the snack to their choice of corner. Be creative, they can walk, dance or jump to the corner!
4. Reveal the correct choice.
5. If it is correct, ask the participant to place the container underneath the sign and walk, dance or jump away.
6. If it is at the wrong place, encourage participants to go the correct corner.

After all the kids have gone, review which categories that the kids actually placed the snacks in compared to the green, red, and yellow categories listed below. Correct and discuss any mistakes. Also, remind participants of how often they are supposed to eat each type of food. Green is fine anytime you are hungry. Yellow foods can be eaten sometimes, like once or twice per day. Red foods you eat rarely like 1-2 times per week.

	Green	Yellow	Red
Message:	Anytime You’re Hungry (during the day)	Sometimes (1-2 times per day)	Rarely (< 1-2 days/ week)
Snacks:	Fruits (Apples, bananas) Vegetables (Carrot sticks)	Seeds/Nuts Baked Chips Pretzels Low-fat/Low-sugar Granola Bars	Regular Chips Cakes (Snack cakes) Donuts Cookies/Candy High Fat Popcorn

Activity:**Questions:**

- Where can you get GREEN light snacks in your neighborhood?
- What types of GREEN snacks can you get at the corner store?
- What types of green foods do you wish where in your corner stores and carry-outs?
- What would you say to your corner store owner to convince them to get [insert GREEN snacks mentioned in previous question] in their store?

Now, we are going to take about 10 minutes to write a letter to the store owners in your neighborhood. Tell them what types of foods you want to see in their stores and why you want them. You can draw pictures in your letter to help get your point across if you want.

Modified from: Sugar Shocker Curriculum

<http://www.capitalhealth.ca/NR/rdonlyres/e6nstouxulgpkbvzot7as7dhtyv6storxwnl57sbz4gl6o2im2rgwio4tthag2r5vag2aoqodp7fst6zyagrafdccb/Sugar+shocker.pdf>

EXPERIENTIAL LEARNING: RED LIGHT, GREEN LIGHT, EAT RIGHT

Materials:

- None
- Number of youth-leaders: 2 or more

Instructions:

- 1.) This activity is a twist on the “Red light, green light game.” Begin by the youth-leader being “it” and playing a few rounds of the red light, green light game as you normally would. Here are instructions:
 - a. Have the kids line up in a straight line at one end of the gym. The youth-leader who is “it” stands at the other end of the gym. The kids should be facing the youth-leader who is “it”.
 - b. When the youth-leader calls out “GREEN light” the kids can race toward the youth-leader.
 - c. When the youth-leader calls out “RED light” the kids have to freeze in place. If anyone is caught moving after “Red light” is shouted, then they have to go back to the starting line.
 - d. The youth-leader continues to call out “GREEN light” and “RED light” until someone tags the youth-leader. The person who reaches the youth-leader first wins.
 - e. For an additional twist, you can add the command “YELLOW light” where the kids can still move forward, but have to move slowly.

- 2.) After the kids get the hang of the red light, green light game, change it up to apply to the “stoplight method” for picking healthy foods. In this version the leader calls out names of “GREEN light” snacks (green light) and “RED light” snacks (red light). For example, the leader may call out “oranges” and the participants move forward, or “Cheetos” and the children have to stop. Participants that move when a “stop” snack is called must go back to the beginning. The first person to get to the opposite side wins!
- 3.) After completing the game, ask participants to talk about their favorite snacks. Which “RED light” snacks would they be willing to give up? Which “GREEN light” snacks would they like to try instead?

Modified from: <http://www.foodandfun.org/resources/pdf/units/unit4.pdf>

UNIT 3: BREAKFAST

LESSON 1: BREAKFAST AS AN ON-THE-GO SNACK

EDUCATIONAL ACTIVITY STATION

Learning Objectives:

1. Participants are able to understand why eating breakfast is important
2. Participants will be able to discuss why some breakfasts have more health benefits than others

Materials:

- Post-it easel
- Markers

Instructions:

Greeting & Ice breaker of your choice (5 minutes)

List icebreaker: _____

Opening Discussion Topics (15 minutes)

Write an imaginary student's schedule that includes times for dinner and/or bedtime snack, going to bed, waking up, arriving at school, lunch, etc. Solicit responses from the kids to help you complete the schedule. For example, ask: **Questions: What time do you usually eat dinner (or a bedtime snack)? What time do you get ready for bed? What time do you wake up in the morning to get ready for school? What time do you eat breakfast?**

Question: How long is it between dinner and/or bedtime snack (whatever the last thing that you ate the night before) and the time you ate breakfast? (Calculate the number of hours between dinner and breakfast). Emphasize that the time between dinner (or bedtime snack) and breakfast is often the longest amount of time we go without eating. If the student does not eat breakfast in the morning before going to school: **Question: How long will it be until you eat lunch?** If you've skipped breakfast that can be a long time to go without eating anything!

Question: Did you eat breakfast today? If someone skipped breakfast ask them why they skipped it. If no one skipped breakfast, ask: **Question: What are some reasons why people might skip breakfast?** (Solicit responses: long bus ride, gotta get little siblings ready to go, you are too busy, don't feel like eating) **Question: How would skipping breakfast make you feel, for example, at lunchtime?** Most people would feel very

hungry, tired, and grumpy when they go for a long time without eating. Today we will be talking about the benefits of eating breakfast and making healthy choices. Remind the participants that that lots of people say 'breakfast is the most important meal of the day' and that we should eat breakfast everyday. **Raise your hand if you've heard that before? Why do you think people say that?**

People say that because breakfast provides our bodies with energy and nutrients to start the day right.

However, some breakfasts provide you with more nutrients than others. For example, punch and chips does not provide you with the same kinds and amounts of nutrients that you would get from a breakfast that includes low-fat milk and cereal with fruit.

Question: What are reasons to eat breakfast? List on a post-it easel. The following are some answers they may give:

- Breakfast fuels the body with nutrients.
 - Breakfast provides energy for the morning's activities.
 - You have not eaten for eight or more hours- that's a really long time!
 - You learn better in school if you eat breakfast.
 - Breakfast helps you keep a healthy body weight.
 - Breakfast helps control the urge to have too many snacks or eat too big of a lunch.
 - Breakfast helps you feel good.
 - Your stomach might hurt from hunger pangs if you miss breakfast.
 - Breakfast tastes good.
 - Other things you can think of:
-

Breakfast doesn't have to be cereal—it can include dinner leftovers and sandwiches too. **What are other examples of things you could have for breakfast?**

Name some examples: _____

Modified from:

Breakfast Choices to Benefit Me

http://www.nutritionnc.com/resourcesforschools/docs/brainFuel/EducationalResources/Curricula/Lesson%20Plans/BBF_Grade4_BreakfastChoicestoBenefitMe_Complete.pdf

EXPERIENTIAL LEARNING ACTIVITY STATION: HEALTHY HOUSE (30 minutes)

Materials:

- Soft balls, small bean bags, or balloons of different colors (Since the balls/bags/balloons will be tossed about, it is fun to mix them up since they will all move differently)
- Masking tape or cones to set middle line
- This game requires large space, such as a gym, cafeteria or field
- **Number of Leaders Needed: 4**

Setup:

- Divide the group into two teams and arrange the teams on opposite sides of the gym
- Create a middle line with the masking tape or by placing cones along a middle line
- Scatter the balls, and balloons in front of the teams. Try to make the balls about even on both sides of the line.

Instructions:

The objective is to toss all of the “unhealthy breakfast” (balls) into the other team’s “house” while keeping the “healthy breakfast foods” in your “house”.

1. For the first round: On “Go!” the players will rush to toss their balls, bags, and balloons into the other team’s playing area (“house”). On “Stop!” the players will see which team has the fewest bags or balls. Let the kids go for about 5 minutes. This will just familiarize the kids with the game before introducing the next steps.
2. Continue play, but introduce strategy by announcing that a certain color represents “unhealthy” or “healthy” breakfast foods. For example, red balls are “unhealthy breakfasts” and green balls are “healthy breakfasts”. Now the teams must try to get rid of those unhealthy breakfasts by tossing them away. They also have to try to keep the “healthy” breakfasts
1. Extension Activities: Introduce a third level of strategy by having children call out the name of the “unhealthy” breakfast food before they can get rid of it and the “healthy” breakfast before they can keep it. The breakfast food must meet the criteria or else the player may not get rid of or keep the ball.

Examples of unhealthy breakfasts may include: sugary cereal (frosted flakes, lucky charms, fruity pebbles), greasy meats like bacon or sausage, poptarts, donuts, toaster pastries. Examples of healthy snacks may include: Apple, banana (any fruit), low-sugar cereal, whole wheat toast or waffles

Modified from: Harvard SPH, Food & Fun After School Unit 6: Health Snacks Super Snacks!
http://www.hsph.harvard.edu/prc/files/2012/11/unit_6_snacks.pdf

UNIT 4: BHCK COOKING CLASS

LESSON 2: What's Cluckin'? Crispy Baked Chicken

The What's Cluckin' lesson is designed to teach youth how to prepare a healthier alternative to fried chicken which is a popular dish in urban communities in Baltimore City.

Learning Objectives:

1. Participants will know how to create crunchy parmesan chicken strips without deep frying the chicken
2. Participants will learn how to cut boneless chicken breast into strips
3. Participants will understand how to be safe when handling raw meat including sanitizing and proper cooking temperatures.

Ingredients:

- Corn flakes
- Boneless chicken breast
- 1 egg or milk
- Parmesan cheese
- Black pepper
- Salt

Supplies:

- Cooking pan or skillet
- Convection oven
- Cooking spray
- Bowl

- Whisk
- Plastic chefs knives and forks
- Plastic cutting boards
- Plates
- Napkins
- Measuring cups
- Spatula
- Cooking pot
- Plastic cutting boards
- Hand Sanitizer
- Dish Soap
- Cleaning spray and wipes

Preparation:

- Chefs should prepare for class by setting out materials for their demonstration station
- Set up workstations - Place all materials that the kids will need to make their chicken strips on their cutting boards.

Reflection/ Discussion Questions:

- Was last week anyone's first time having [inset name of previous recipe] like this?
- Would you have added anything different or changed it at all?
- Did you try making your own [insert name of previous recipe] since last class?
- Did you make the [insert name of previous recipe] for yourself? Your family?

- What were your likes/ dislikes of last weeks class?
- Has anyone used anything we learned in class at home yet? If so, what?
- Other questions: _____

Food Safety Lesson:

- Food borne illness, sometimes called food poisoning, happens when you eat food that makes you sick. Raw meats need to be cooked to proper temperatures to kill any bacteria that might be in it and keep it from making you sick
 - Chicken 165
 - Roasts/steaks 145
 - Fish 145
- You can only tell this by a food thermometer
 - Insert into the thickest part of the meat before reading
 - Be sure to give it enough time to register (about 10 seconds)
- *show picture or example of food thermometer
- Like with the eggs last week- be sure to carefully sanitize the surfaces—don't let things you eat raw (like vegetables) touch the things that come in contact with the raw chicken

Cooking:

Remind kids that “Your yuck may be someone’s yum” and we do not want to make anyone uncomfortable eating their food.

Head Chef (kids should be following along with each step):

- Demonstrates cooking steps and measurements for the recipe
- Demonstrates how to cut chicken breast into strips
- Demonstrates how to crush the cornflakes to make the coating for the chicken
- Demonstrates how to combine all ingredients
- Recap on how to crack an egg

Assistant Chef:

- Assists the kids with cutting, if needed
- Helps hand out supplies
- Keeps the kids organized and on task while the head chef leads the lesson

Ingredients:

- 12 cup crushed cornflakes
- 1.5 cup parmesan cheese
- 3 ¾pound skinless boneless chicken breast, cubed
- 3 beaten egg or 1.5 cup milk
- Cooking spray
- Salt and ground black pepper, to taste

Directions:

1. Combine cornflakes and parmesan cheese in a plastic bag and crush with hands
2. Cut chicken into small strips or cubes for either crunchy chicken strips or nuggets (note, nugget-sized pieces are better for this class because of the lack of a full-sized oven)
3. Dip the chicken in egg or milk, then place in the bag with the cornflakes mixture.
4. Shake the bag to coat the chicken.
5. Bake for about 10 minutes if using a traditional oven or 20 minutes for a toaster oven or until the internal temperature of the chicken reaches 165 degrees F.
6. *The chicken can also be cooked on the stove top using cooking spray and carefully monitoring the chicken to prevent burning*

Serves 12

Optional Activity During Baking Time -Watch A Healthy Cooking Video (for example Chef Egg's video on making fruit salad)

Discussion Questions for after the video

- What did you like about the video?
- What didn't you like about the video?
- What did you take from the video?
- Did you learn anything from the video?
- Other questions: _____

Nutrition Lesson:

(instructors can add these points into the lesson throughout as they feel appropriate)

- We're going to discuss the difference in baked/grilled and fried food
- Can anyone name fried food
 - Fried chicken
 - French fries
 - Funnel Cake
 - Potato chips
- Fried foods are generally breaded and dropped into hot oil
 - A lot of fat is added when food is fried
- Baking and grilling uses heat from the oven to cook the food thoroughly
 - Less fat is used
- Which do you think is healthier?
 - Can you think of a way to bake/grill your favorite fried food?

Discussion Questions While Eating:

- Did you enjoy making the food?
- Are you enjoying the food?
- Would you change anything? Add anything?

Clean up:

- Cleaning up stations
- Wipe down all surfaces used
- Clean off all floors and surrounding areas

Instructor Tips and Tricks:

- Baking times will be variable based on your oven and size of chicken- for a limited amount of time, cut chicken into smaller pieces
- Be sure to have the kids wearing gloves, changing gloves when necessary and washing hands frequently. Emphasize food safety while handling raw meat.
 - Know your rec center and the space that you will be working in. Think through any additional considerations you will have to make because of the rec center space, especially when working with raw meat.
- Remind kids that different spins on foods they are familiar with (for example fried chicken that is not deep fried) can be delicious but they will not know if they do not try it.
- Have greens and salad ingredients such as carrots, tomatoes, and cucumbers as a way to serve the chicken over greens or as a side dish.
- Using egg or milk in the recipe is effective- choose based on what fits into a budget, what is available, and allergy concerns of any participants

TASTE TEST STATION

Materials:

- ~30 of beverage/food to be promoted
- Plates or napkins
- Taste Test Rating sheet
- **Number of Leaders Needed: 2-3**

Setup:

- Determine how many children will taste the food and purchase the appropriate amount of food to be tasted.
- Prepare food samples in advance, if possible, and have all materials (plates, small cups, napkins, etc.) readily available, along with clean-up items such as paper towels, wet wipes and trash bins.
- Maintain proper sanitation procedures: clean work and surface areas, wash and dry all produce, and wash all hands.
- Copy the taste test rating sheet (APPENDIX 1), and consider writing in the foods to be tasted before copying the sheet. Each page has space to try two food items, so copy additional pages if you are trying more foods.
- If you do not have access to a copier, try a creative rating method, such as placing popsicle sticks into coffee cans or other containers labeled with the rating options. (Like A Lot! Like Somewhat. Do Not Like Very Much.)

Instructions:

- Taste tests encourage participants to try new healthy foods in a fun way.
- Have participants try a new food and praise them for trying the food.
- Do not force anyone to try a food; however, explain that although they may not think they are going to like the new food, that tasting is a good way to find out.
- Have participants express their opinions on their rating sheets.
- Summarize the group's evaluation (Did they like the food a lot? Somewhat? Or Not very much?) and decide whether or not they would eat/drink/make that food/beverage/recipe again. Provide opportunities for feedback and comments on the taste, texture and smell of the food.
- Be creative! Try blindfolded taste tests or incorporate taste tests into a team or group activity!
- **Hand out sample healthy snacks and explain that these are better alternatives that will help keep full and focused throughout the day and full of energy. These snacks are healthier because they have less salt, sugar and fat.**

Modified from: Harvard SPH, Food & Fun After School Unit 6: Health Snacks Super Snacks!
http://www.hsph.harvard.edu/prc/files/2012/11/unit_6_snacks.pdf

Taste Test Rating Sheet

Today I tried: _____

I liked this:



A lot!



Somewhat



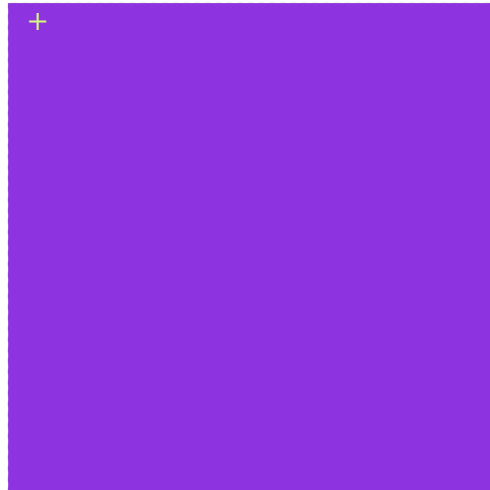
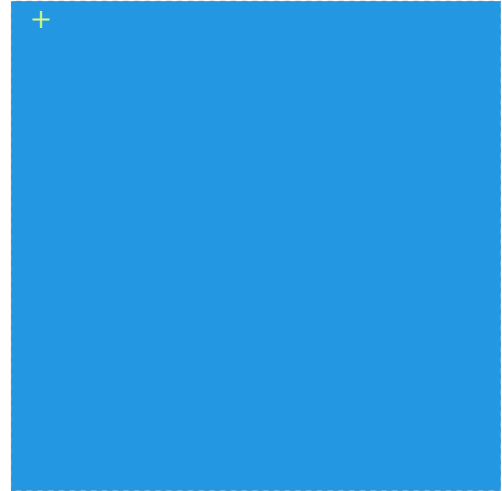
Not very much

Would you try this food or drink item again??

How would you change this food or drink to make it more appealing to you?

Comments on the look, taste, feel or smell of this food:

Appendix E:
Youth-leader Training Toolkit Excerpts



**Johns Hopkins
Global Obesity
Prevention Center**

615 N. Wolfe St. W2041
Baltimore, MD 21205
Phone: 410.502.0600
E-Mail: bmorehealthyc4k@gmail.com
Web: healthystores.org

This curriculum was written through a partnership between the New Lens and the Johns Hopkins Bloomberg School of Public Health.

Contributors:

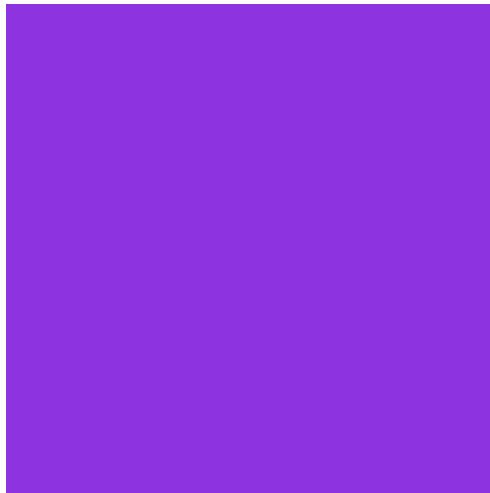
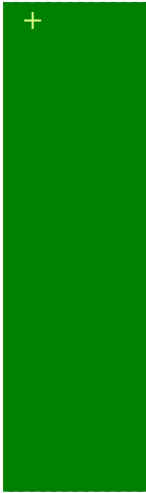
- Betsy Anderson Steeves
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- Chelsea Sherman
- Cara Shipley
- Rebecca Yenawine

B'More Healthy Communities for Kids:

Youth-leader Training Toolkit



This toolkit is dedicated to all of the young people in our inaugural youth-leader willingness to jump right in to this training program, to learn, to provide lots of feedback, and to teach us as much as we could ever hope to teach you.



**B'More Healthy Communities for Kids:
Youth-leader Training Toolkit**

Introduction & Guide to Using this Toolkit

Introduction

American adolescents have high rates of obesity and poor diet quality. The literature shows that peers and friends can have significant influence on an individual's eating and activity behaviors. Behavioral theory suggests that many aspects of our social relationships such as social modeling, social support, and observational learning are key factors in how our social environment influences our behaviors. In the broader health literature youth- or peer-led programs have shown to create outcomes that are equal to or greater than those of traditional adult-led programs. Younger youth see youth- or peer-leaders as relatable, reliable, and credible sources of information. Recent nutrition interventions for youth and adolescents are capitalizing on the powerful influence of these relationships by incorporating youth as leaders of nutrition programs. However, nutrition programs incorporating youth-leaders into interventions are still lacking, and could be strengthened to improve implementation and dissemination. One reason that researchers and program managers may shy away from incorporating youth-leaders into intervention delivery is because of the daunting task of identifying, training, and retaining young people who are able to serve as youth-leaders and deliver programming at a high fidelity level. The purpose of this youth-leader training toolkit is to reduce some of those barriers and to provide a research-tested program for engaging, empowering, and preparing young people to serve as youth-leaders in delivering nutrition interventions.

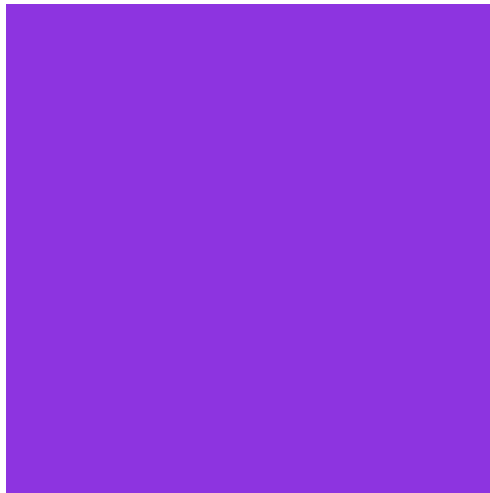
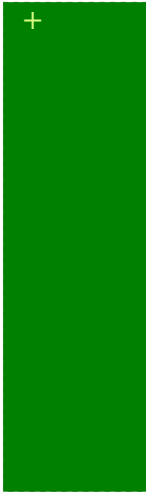
This toolkit was developed for the B'More Healthy Communities for Kids intervention (BHCK). BHCK is a multi-level, multi-component community-based obesity prevention program targeting early adolescents and their families in low income, predominately African American neighborhoods in Baltimore City, Maryland. For more about the BHCK study visit: <http://www.ncbi.nlm.nih.gov/pubmed/?term=b'more+healthy+communities+for+kids>.

This toolkit was developed through a partnership between the Johns Hopkins Bloomberg School of Public Health and New Lens (<http://www.newlens.info>). New Lens is a youth driven social justice organization that makes art and media about issues where a youth perspective can inspire change. This partnership allowed youth and adult leaders to work collaboratively to generate a toolkit of training materials with engaging activities that allow youth to embrace the youth-leader role, while providing them the skills they need to thrive as youth-leaders.

Guide to Using this Manual

The BHCK program had a specific role for their youth-leaders; they were assigned to (1) lead younger youth participants (ages 10-14) through a curriculum that included fourteen one-hour group sessions focused on nutrition and healthy eating in an afterschool program setting (2) work with staff members to deliver interactive sessions, including taste-tastes and brief information sharing, in small retail food outlets (i.e. corner stores, carry-outs) and (3) generate and share social media content (Facebook, Instagram) promoting the BHCK study or other nutrition-related content. This training program was designed to provide and enhance youth-leaders skills in several key areas related to succeeding in these roles including leadership and teamwork skills; communication and group facilitation skills; and preparing and planning skills,

just to name a few. While similar skill sets may be beneficial to other types of youth-leader programs, we understand that youth-lead programs are very unique and rely heavily on the relationships formed among the youth-leaders, and between youth-leaders and group facilitators. Because of this, we have tried to make it as easy as possible for individuals starting a new youth-led nutrition program to select the components of this training that are the most relevant to their program, and use those to build a unique training plan for their project. Because of the unique needs of each youth-leader program and each youth-leader team, we do not recommend using this toolkit as a cookie-cutter training plan. Rather we encourage you to first identify a few key young people who understand the goals of your project and can work with you to develop your program. Then, work collaboratively with those young people to review the components of this toolkit. Identify the elements that are relevant to the needs and goals of your project and fit well within the population with whom you are working. Search for other sources to fill in the gaps of the additional and unique needs of your program. To make it as easy as possible for you use components of this toolkit, we have divided into sections that contain the various types of activities. The main sections (1) include icebreaker and teambuilding activities and (2) youth-leader skill building activities, followed by additional resources to navigate common challenges of youth-led programs. In the section titled “Structure and Scheduling Trainings” we provide information on how we combined the icebreaker and team building activities and youth-leader skills development activities with the training specific to delivering the BHCK intervention. We provide this information as an example, yet, we would encourage others as they develop youth-led programs to work with a core group of program staff and young people to determine the best structure for their programs.



**B'More Healthy Communities for Kids:
Youth-leader Training Toolkit**

Recruiting & Selecting Youth- leaders

Recruiting and selecting the right group of youth-leaders is a critical first step to successfully building a youth-led intervention. Getting the 'right' young people in the room will determine the extent and types of training needs your program will have. Throughout this toolkit, we will have one consistent recommendation, which is to get young people involved early and in every step of the process. That recommendation starts here. Having a few key youth-leader informants will help you set realistic expectations about what you will need to provide and what you can expect from the population of youth-leaders with whom you will work. We suggest by looking to youth who are in leadership roles within your community to partner with as key informants, for example, look for young people involved in youth-led organizations or who serve on teen councils in our target community.

Recruiting Youth-leaders

Creating advertisements. Identify a succinct way to communicate information about your program, the requirements of the youth-leader position (especially time commitments), and how the youth-leaders will benefit from participating. Ideally, these pieces of information are all things that you would discuss with your youth-leader key informants before you create any sort of advertisements for the youth-leader positions. Get feedback on your recruitment materials and strategies from youth and others familiar with your program to make sure that you are sending the best message. Think about multiple formats for sending out your recruitment material, including electronic and social media outlets. Create clear and stream lined directions for what the next steps are to get more information or to apply for the position.

What's in it for them? Youth often have many opportunities presented to them, so to attract high quality youth-leaders you will need to think about how the program will be a good fit or provide benefits for them. Can they earn service-learning credits? Will they be paid a stipend or receive hourly pay? Will they be helping children or the community? Can they use it as a resume booster when applying for college? Discuss with your key informant youth what types of incentives youth-leaders will need to be a part of your program. For the BHCK program, we provided an hourly pay rate of \$10/hour for our youth-leaders, based on the recommendations of previous youth-leaders that we worked with when developing our program. If you cannot provide pay, think of potential other ways to incentive participation, for example providing subsidies for travel (bus tickets), raffles, having snacks at meetings, etc.

Consider timing. Most young people's schedules are heavily dependent upon the school year. Use that to your advantage by recruiting at specific times, for example at the end of the school year, when youth are thinking about summer opportunities. Avoiding busy times in the school year, such as the first few weeks of school or during exam times when young people may be pre-occupied with other activities.

Get support. Often times other community-based youth programs are happy to help spread the message about youth-leader opportunities, and even refer young people who have strong leadership characteristics. Reach out to these organizations and ask them to spread the word about your program. Also, ask the your key informant young people to avenues they suggest and ways that they hear about leadership opportunities.

Be prepared to cast a wide net. Responses that you receive from recruiting efforts for the youth-leader positions will vary greatly. Many times youth who respond to recruitment

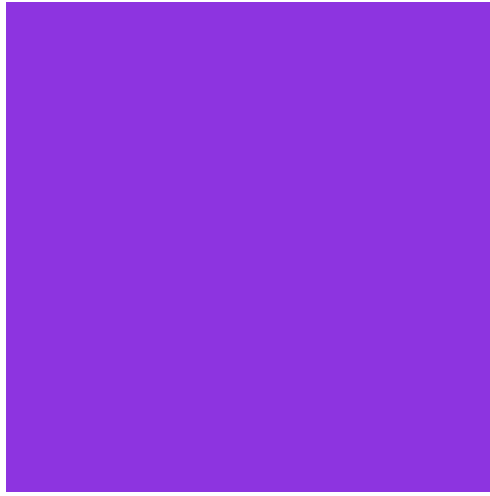
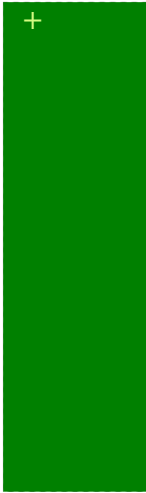
materials will have varying levels of interest and follow through. For example, in response to the BHCK program recruitment flyers were sent electronically via email and social media to thousands of young people (at selected high schools, targeted programs/majors at colleges and university, and through community-based programs). One hundred and thirty five young people responded to the recruitment materials, approximately 60 returned applications to the position, forty-four were interviewed and ultimately sixteen were selected for the positions.

Selection of Youth-leaders

What are you looking for? Think carefully about the traits, knowledge, and skills needed for youth-leaders to succeed in your program, then work backwards to identify characteristics of individuals who meet that description. Do your youth-leaders need to have people skills? Do they need to be detail oriented? Do you want them to be passionate about a certain cause? Or be out-of-the box thinkers? No matter what your needs are, have a clear picture of what you are looking for. Also have a clear picture of characteristics that may raise 'red flags'. For example, the BHCK program involved working closely with early adolescents in group settings, so we needed individuals who had strong people skills and enjoyed working with younger youth. If a potential youth-leader expressed that they got frustrated or had trouble controlling their temper, that was an immediate red flag that the individual was not a good fit for our program.

In general, in the field of youth-leader programs, there are two characteristics that it is recommended to screen for: schedule and internal versus external motivation. Related to scheduling, young people who are attracted to becoming a youth-leader (and who seem like they would be a great fit for your program) are often already serving in leadership roles in many other aspects of their life. While, this is excellent for the young person, program leaders should try to evaluate if this person really has the time availability to take on another leadership role given the other activities they are involved in. Additionally, when looking for youth-leaders it is important to try and identify individuals who have internal motivation rather than external motivation for participating in the program. Ideally, when asked why they want to be a youth-leader, their responses would include statements about benefiting the youth that they will work with, or helping the community rather than directly benefiting themselves. Although providing personal benefits to encourage their participation is helpful, this should not be the main reason why they would like to be a part of the program.

The Application Process. Think about how difficult or easy you want the application process to be. A rigorous application process allows you to naturally screen out youth who may be less interested or unwilling to stick with the program for the long term, but also runs the risk of being overly burdensome and not providing enough candidates. In the BHCK program youth-leader candidates completed an application (see Appendix A) and an in-person interview to be considered for the positions. The interviews lasted between 30-60 minutes and were conducted by a BHCK study staff person along with a key informant youth. The staff person and the key informant youth worked collaboratively to select the youth-leaders for the program. Being from a similar culture the key informant youth was able to better read nonverbal cues and provide critical insight into the selection process that otherwise would not have been achieved.



**B'More Healthy Communities for Kids:
Youth-leader Training Toolkit**

Recruiting & Selecting Youth- leaders

Scheduling Trainings

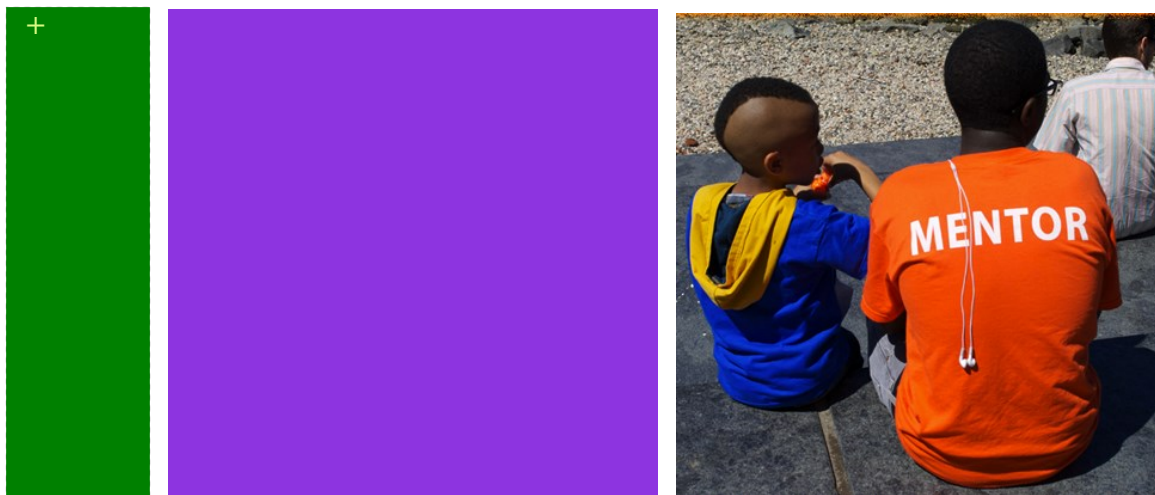
If possible, schedule the training sessions during the same time frame that you deliver the program. For an after-school program, have the training after-school. For an evening or weekend program, have the trainings on evenings and weekends. If you are going to various community sites to deliver the program, try to set up training sessions at each of the sites. This allows the youth-leaders to incorporate the schedule into their routine and helps programs staff to identify any schedule-related problems that may occur in advance of the program start. Also, try to set the training sessions up so that they occur more than once per week. Increased frequency of contact allows for initial bonding between youth-leaders and boosts engagement in the program.

Structure of Training Sessions

In this section we will describe how the training sessions for the BHCK youth-leader program were structured using the components of this toolkit. We do this to provide an example of how the toolkit components can be used together, rather than intending this to be a direct template for other programs or projects to follow. It is important for program leaders in collaboration with key informant youth to identify the best structure of the training program for their unique project.

The BHCK training sessions were held twice weekly for 2.25 hours per session. The trainings were held from 4-6:15pm, as this approximated the time that the youth-leaders would spend working in the community. Each session began with one of the ice-breaker/ team building activities, lasting about 5-10 minutes. The next hour was spent doing the youth-leader skill building activities. Many of the ice-breaker/ team building activities and youth-leader skill building activities were paired so that there was a consistent theme or skill set that was being promoted during that session. After these components were completed, we provided a 5 minute break, at which time healthy snacks were provided to the youth-leaders.

The remainder of the training session was used to review the BHCK curriculum that the youth-leaders would be delivering in the community (note: this curriculum is not provided as part of this training toolkit, but is available upon request by emailing bmorehealthc4k@gmail.com). To review the curriculum, a BHCK staff member first talked the youth-leaders through the main conceptions of the lesson and answered questions, then youth-leaders were selected to read the curriculum out loud to the group. Once the youth-leaders had a general understanding of the session content, they were broken up into two groups and assigned a component of the session to plan for and to teach to the other youth-leader group. The youth-leader skills learned during the first half of the training session were reinforced here, as we encouraged the group to implement the skills during their presentation of the curriculum. After both groups had an opportunity to present their components of the curriculum to the other group members, we shared a time of reflection and constructive critique, to make sure that we were prepared to deliver the session in the community.



**B'More Healthy Communities for Kids:
Youth-leader Training Toolkit**

Icebreaker & Team Building Activities

**(SAMPLE – for full curriculum visit:
healthystores.org)**

Icebreaker / Team Building Activity: Baltimore Bingo (estimated time: 10 minutes)

Give each participant a bingo card and a pen. Explain that the group has 10 minutes to mingle, introduce themselves, and find people who match the traits on the card. They must put the person's name in the corresponding box or have the person sign the appropriate square. If you have a large enough group, you can require that each person is only allowed to sign the card once. With smaller groups, you may need to allow people to sign others' cards multiple times. The first person to fill five boxes across or down yells BINGO! and the game is over. Ask participants to introduce themselves and share one of the interesting traits they learned about someone else. Tailor statements in the Bingo card so that they are relevant to the group.

· *Lessons learned: communication, team-building, relationship building*

B	I	N	G	O
I was born in Baltimore.	I have gardened or grown a plant.	I like to cook.	I have been to an Orioles game.	I know more than 1 language.
I have a pet.	I like spicy food.	My favorite season is winter.	I ride a bike.	I have worked with children in the past.
I have done an internship in the past.	I am vegetarian.	FREE SPACE	I was born outside Baltimore.	I like pancakes.
I have been to the Baltimore aquarium.	I have worked as a volunteer in the past.	I am a Ravens fan.	I like Chipotle.	I have been to a farmers' market.
I am a picky eater.	I am an only child.	I like crab cakes.	I am the youngest in my family.	I have been to Lexington market

Icebreaker / Team Building Activity: 2 truths and a lie (estimated time: 10 minutes)

Start by instructing everyone in the group to think of 3 statements to about themselves. Two of the statements will be true facts, and 1 will be a lie. Go around the room having everyone state the 3 facts about themselves, making each statement as convincing as possible. Have the other group members try to guess which statement is the lie.

- *Lessons learned: getting to know each other, team-building, communication/effective presentation*

Icebreaker / Team Building Activity: Name that leader (estimated time: 15 minutes)

Set-up: Get name tag stickers and write the names of famous leaders on each nametag. Make enough name tags so that there is one for each participant. To make the game is more interesting for advanced groups, select a variety of leaders including those who are highly controversial.

To play: Pass out the stickers in such a way that each participant has a sticker on their back. The participant should not look at or be able to see the nametag that is placed on their back, but others should be able to read it easily. Give the group 7 minutes to talk with each other. During this time, each individual should ask questions to other group members to help that individual guess which leader they have written on their back. Once the individual correctly guesses the name that they have on their back, they can continue to help others by answering questions. After the game, reflect as a group on the leadership characteristics of the different people on the nametags.

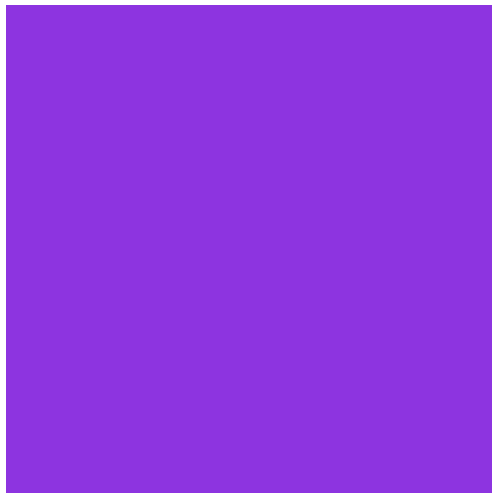
Suggested Reflection Questions:

- Do you agree that all of these people are leaders?
- Is there anyone who you would not consider a leader? Why do you say that?
- What characteristics do these leaders possess?
- What are the qualities of a good leader? (Write qualities on the white board as you discuss)

Suggested leaders can include (leaders can be adapted to each group):

- Ray Lewis
- Stephanie Rawlings-Blake (the Mayor of Baltimore)
- Barack Obama
- Michelle Obama
- Malcolm X
- Dr. Martin Luther King
- Rosa Parks
- Harriet Tubman
- Nelson Mandela
- George W. Bush
- Oprah Winfrey
- George Washington

Lessons learned: characteristics of leaders, communication (asking questions about the leaders), team building (working together to solve the task)



**B'More Healthy Communities for Kids:
Youth-leader Training Toolkit**

Youth-leader Skill Building Activities

**(SAMPLE – for full curriculum visit:
healthystores.org)**

Youth-leader Skill Building Session 1: Program Introduction, Peer-leader Responsibilities and Position Requirements (1 hour 40 minutes)

Begin with introductions. (5 minutes)

Go around the room and have everyone state their name, what school they attend, what they do outside of the program. *Different programs/settings can add to or adapt elements of the introduction as appropriate.*

Start with the 'Choose What You Chew' video: (5 minutes) This is a documentary-style video where young people describe unhealthy and healthy foods they enjoy and talk about their rationale for and challenges with making changes in to their diet. The video also presents a nice discussion about how the food environment can sometimes made it hard to eat healthier foods. This video was produced by New Lens Productions and can be accessed via YouTube at <https://www.youtube.com/watch?v=pHJpTYfkMGo>.

· Discussion Questions for Choose What You Chew: (10 minutes)

1. What did you think of the video?
2. What did you take from the video?
3. Can you relate to any points that were made in the video? Why or why not?
4. Do you think about the foods that you eat before you eat them? Why or why not?
5. How can you tell if something is unhealthy or not?
6. Do you enjoy eating unhealthy foods? Why or why not?
7. Is healthy eating important to you? Why or why not?
8. Do you have access to healthy foods? Why or why not?
9. How often do you eat healthy foods?
10. Have you made changes to your diet? Why or why not?
11. How does eating unhealthy/healthy affect you? Your family?

Program Overview (15 minutes)

If this is the first time your youth-leader meet as a group, take time to formally provide an overview of the project/program. This presentation should be brief (less than 10 minutes), but provide necessary information about the program, so that clear expectations are set for the basic requirements of the youth-leader role. Allow time for the youth-leaders to ask questions and discuss program components. Invite feedback from the youth-leaders on the program.

Create a Behavioral Contract (30 minutes)

Once you have set clear expectations for the youth-leader role, work with the youth-leaders to collectively create a "Behavioral Contract." The Behavioral Contract will be a set of rules & consequences that governs the youth-leaders. It is important that the content of the Behavioral Contract be generated and agreed upon by the youth. Group facilitators can guide the discussion and provide structure, but allowing the youth-leaders to set the general rules and consequences for not following those rules creates buy-in and eases issues with discipline. You can introduce the concept to the youth-leaders as a list of 'Do's and Don'ts' for being a youth-leader. Begin this process by breaking up the youth-leaders into small groups and encourage

them to brainstorm their lists. Provide each group a poster board and markers to record their ideas. Have each small group present their lists to the others. During the presentations, discuss each group's list and determine which items will make a "final" Contract. As a facilitator, you can guide the youth to consider scenarios that they might need to create do's and don'ts for that do not come up in the initial conversations. After the session, take the final list and draft a "Behavioral Contract" document for the group. Bring print outs of the contract for the youth-leaders to approve and sign the following session. The final behavioral contract can be integrated into a Youth-leader Manual of Procedures, and should be kept on record for each youth-leader. An example Behavioral Contract can be found in Appendix B.

Build the Rationale for your Program (30 minutes)

Explain what the "food environment" is and how it can impact our health. (5 minutes) Explain that a **food environment** is a collection of physical, biological and social factors that affect an individual or a group of individuals eating habits and patterns. Take time to discuss this definition and allow the youth-leaders to create a 'real' or 'relatable' definition of the food environment for the group. Use the documentary "Soul Food Junkies" by Byron Hurt (available here: <http://www.pbs.org/independentlens/soul-food-junkies/>) or another video to explore concepts related to the food environment and culture in a relatable way. Handout notecards for youth leaders to write down their thoughts and reflections as they watch the video.

Show clip from "Soul Food Junkies" or *another video that is pertinent to program contents* (show any relevant clip that lasts 15-20 minutes)

Discussion Questions for Soul Food Junkies: 10 minutes

1. What did you think of the video?
2. Can you relate to anything said in the video?
3. Do you think soul food plays an important role in African American culture? Why or why not?
4. Why do you think soul food is important to the African American culture?
5. Do you think soul food is the cause of health problems within the African American communities? Culture?
6. Does eating soul food affect you personally? Your family? If so, how?

Closing Activity (5 minutes)

Go around and say one thing that personally hope to get out of this program and one hope that they have for the community.

Leadership Challenge (to do before the next session): To walk their neighborhood and take a significant look at their food environment. What foods/drinks were present? What foods/drinks were not available? How does the price of different foods compare?

Youth-leader Skill Building Session 2: Teaching/group facilitation skills (70 minutes)

Check-in on the Leadership Challenge & Follow-up on Behavioral Contract. (5 minutes) At the end of the last session we encouraged the youth-leaders to intentionally notice and think about the food environment in their neighborhoods. Ask them what they noticed? Ask if they were surprised by anything they noticed about their food environment, and if it related to anything discussed in the last session.

Provide each youth-leader a copy of the Behavioral Contract that they generated during the last session. Ask if anyone has any questions about the contract or any changes that need to be discussed. Once discussion is complete, have each youth-leader sign a copy of the contract indicating their agreement and commitment to following the contract.

Introduction to Group Facilitation. (60 minutes) Introduce Visual Understanding in Education (VTS, see Appendix C for a more detailed description) to the group. Explain that it allows students to examine things, contribute observations, and ideas, and to build understanding together. As a youth-leader you will be asked to talk and discuss ideas about healthy eating with the youth at various settings, so these skills are directly related to the youth-leader role. VTS also helps us be able to facilitate better group discussions. In this activity, we will look at and discuss several pieces of artwork. A facilitator leading the training will run the first VTS exercise. Then youth-leaders will be asked to join in and volunteer to run the next session. The content of the artwork/images you use for this can be anything, however, content related to the topic area may serve a dual role to teach facilitations skills and sparks insightful discussion. We recommend images from:

- Witnesses to Hunger (a photovoice project related to food insecurity):
<http://www.centerforhungerfreecommunities.org/our-projects/witnesses-hunger/gallery>
- Alan Sailer's Flickr stream with images of food being blown up:
<https://www.flickr.com/photos/8763834@N02/sets/72157629885529193/>

Here is how it works. First the group leader will call participant's attention to the first image and provide several minutes for participants to look at the image.

Asking the Questions. After they have examined the image, ask the question, What's going on in this picture? Once participants have learned this question, use variations of similar questions.

- Whenever participants make a comment that involves an interpretation (a comment that goes beyond identification and literal description), respond first by paraphrasing, and then ask, **What do you see that makes you say that?** Once participants understand the point of this question, begin to vary it.
- In order to keep participants searching for further observations, frequently ask them, **What more can you find?** Again, variations are useful once participants are familiar with the point of the question.

Responding to Participants' Comments. Listen carefully to participants, making sure that you hear all of what they say and that you understand it accurately.

- **Point** to what they mention in the picture/image. Be precise, even when it is a comment that has been repeated.
- Use encouraging **body language** and facial expressions to nurture participation (discuss with the youth-leaders what they think this would look like, ask youth-leaders to get out of their seats and demonstrate the body language they are describing).
- **Paraphrase** each comment. Change the wording, but not the meaning of what is said. In rephrasing, demonstrate the use of proper sentence construction and rich vocabulary to assist participants with language.
- **Accept each comment neutrally.** Remember that this process emphasizes a useful pattern of thinking, not right answers. Participants are learning to make detailed observations, sorting out and applying what they know. Articulating their thoughts leads to growth even when they make mistakes.
- **Link** answers that relate, even when there are disagreements. Show how the participants' thinking evolves, how some observations and ideas stimulate others, how opinions change and build on others comments.

Wrapping up. Once the group has seen this process delivered by the instructor, ask for volunteers to go through the process with the next image. Once participants begin to get comfortable in the role, add extra challenges. The first challenge is that they have to maintain eye contact with the audience. The second challenge is that they are not allowed to “uh” or “um” while presenting. Have the group gently remind them when they forget to follow through with the added challenges. After several participants have had a chance to serve as a leader discuss the process, what was difficult/easy/unexpected about leading the discussions.

Depending on your group size, you can adapt this activity. A smaller group (4-5 youth-leaders) can easily go through this process together. For larger groups, it might be helpful to split into small groups, with 3-4 youth-leaders and one instructor per group. In an ideal setting, each youth-leader would get a chance to serve as the discussion facilitator.

Youth-leaders may struggle with this activity if it is the first time they are leading an interactive discussion. Be sure to remind the groups that these skills are not mastered all at once, but often come with practice. Let them know that they will have many more opportunities for practice throughout the training sessions.

Closing Activity (5 minutes)

Have the group share one take away message that they got from today's session.

Leadership Challenge (to do before the next session): Remind the youth-leaders that group facilitation skills come with practice. Encourage youth-leaders to tryout their components of their VTS skills in everyday conversation by encouraging them to follow the guidelines for asking questions and providing responses when talking to groups of friends and family members throughout the week.

Youth-leader Skill Building Session 3: What is a leader? (70 minutes)

Check-in on the Leadership Challenge. (5 minutes) Recap on leadership challenge from last week. How did the VTS presentation skills transfer to another area of your life?

“This I Believe a Leader...” Activity (25 minutes) We recommend combining this activity with the ‘Name that Leader’ icebreaker activity. When done in this order, the group begins by identifying characteristics of leadership in other people as part of the icebreaker activity. We also know that it is equally important to develop personal concepts and constructs of leadership. Each youth-leader will write a “This I Believe Essay” to describe in detail their personal concept of what a leader is/does. Details on the “This I believe” essay can be found at <http://thisibelieve.org>. Provide each youth-leader with the This I Believe Essay instructions (Appendix D), paper, and pencil. The main premise of the essay is to finish the statement “This I believe”. The purpose is to identify core values that guide leadership activities. In our case, we will write to the prompt: “This I believe, a leader...”. Go through the directions together and have different youth-leaders read the components of the directions out loud. Confirm that everyone understand the directions and tell them that will have 15 minutes to write their essay. After the 15 minutes are up, bring the group back together. Ask for youth-leaders to volunteer to read their essays (or parts of their essays) to the group.

Reflection Questions:

- What are some common themes that you are hearing in the essays?
- What are some unique things that stand out to you?
- Go through lists of leadership characteristics. What are some specific examples of how you could use this skill when working with youth in the context of your project/program?

As a group, generate a list of leadership characteristics on a poster board.

Distribute and review the worksheet (Appendix E) on what youth-leaders do and don’t do. Ask youth-leaders to read the list out loud. Ask for feedback is there is anything else that they would add to this list

Leadership Scenarios. (35 minutes) Have youth-leaders role play an example of how lack of leadership skills can derail an accomplishment. Role play scenarios can include leaders who: abuse their power, don’t assert enough power, etc. Start by telling the youth-leaders that in future sessions we will do lots of role playing to help prepare them for situations that might happen while they are working with youth and that the role plays will help us discuss the “do’s” and “don’ts” of how to handle those situations. Role plays will also help reinforce the youth-leader skills that everyone will need in this program. (This will help to prepare to introduce the youth-leaders to be introduced to the Theatre of the Oppressed methods that will be used in the next session). Conduct the role pay by breaking the youth-leaders into small groups, provide the small groups with a note card that explains the scenario. Tell them that they need to act out the scenario like it is a play or skit.

After each scenario is presented, use the VTS group facilitation techniques described in the previous lesson to discuss the scenario. Discussion questions can include variations of the following:

- What did you see in this scenario?
- How did the youth respond? How did the youth-leaders respond?
- Can anyone relate to this? Has anyone had a similar experience?
- What are alternatives to this scenario? Use this question to transition into talking about better ways to handle the scenario. Have the youth-leaders generate ideas, in addition to sharing the strategies developed for each scenario.

Suggested scenarios for this session are: “Too Much Information”; “Roping in Distracted Children”; and “Be a Leader, Not a Friend”, however these can be adapted according to the needs and preferences for different projects/programs. *A complete list of role play scenarios are found in Appendix F.*

Closing Activity (5 minutes)

Have the group share one take away message that they got from today’s session.

Leadership Challenge (to do before the next session): As you go through your week this week, continue to think about your personal definition of leadership. Think about times that you really acted as a leader according to your personal definition of leadership. What factors were in place that helped you be able to take on that leadership role? What got in the way of you being a leader at other times?

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CURRICULUM VITAE

Elizabeth (Betsy) Anderson Steeves

PERSONAL DATA:

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E-mail: eander47@jhu.edu

REGISTRATION/ LICENSURE:

Registered Dietitian # 941342

EDUCATION:

- 2011-present **Johns Hopkins Bloomberg School of Public Health**, Baltimore, MD
Doctor of Philosophy
Program: Human Nutrition
Anticipated date of graduation: Summer 2015 (defense date June 23, 2015)
Thesis: The role of social relationships in diet and diet-related health outcomes among urban, low-income African American adolescents in Baltimore City
- 2005 - 2007 **University of Tennessee**, Knoxville, TN
Master of Science, Dietetic Internship
Major: Nutrition; *M.S. Concentration:* Public Health
Summa Cum Laude
Thesis: An evaluation of the education, qualifications, and functions of school food service directors in Tennessee Public Schools
- 2001-2005 **University of Dayton**, Dayton, OH
Bachelor of Science
Major: Food and Nutrition, Dietetics
Magna Cum Laude

PROFESSIONAL EXPERIENCE:

- 2012-present **Johns Hopkins University, Leadership Education in Adolescent Health (LEAH) Fellowship LEAH Nutrition Fellow** (Director: Hoover Adger, MD, MPH, MBA, Nutrition Advisor: Laura Caulfield, PhD)
- Maternal and Child Health Bureau interdisciplinary fellowship focused on health disparities
 - (08/2012-present)
- 2011-present **Johns Hopkins Bloomberg School of Public Health Global Center on Childhood Obesity Trainee** (Principle Investigator: Bruce Lee, PhD)
- Developed systems science models (agent-based models, systems dynamics models, and social network models) of components of the Baltimore City food system with an interdisciplinary team
 - (05/2011-present)

2011-present **Johns Hopkins Bloomberg School of Public Health, Center for Human Nutrition**

Project Coordinator: *B'More Healthy: Communities for Kids* (Principle Investigator: Joel Gittelsohn, PhD)

- Created and maintained on-going partnerships with community stakeholders
- Planned and conducted formative research with the target population, pilot tested intervention components
- Developed and conducted a multi-phase, peer-led nutrition intervention with children aged 10 to 14 years in Baltimore City recreation centers
- Trained and supervised a staff of 15 graduate research assistants
- Supervised primary data collection for 300 youth and caregiver dyads, and analyzed data in preparation for manuscript publication
- (05/2011-present)

Project Coordinator: *Maryland Healthy Stores Study* (Principle Investigator: Joel Gittelsohn, PhD)

- Conducted needs assessment of the participating counties
- Collaborated with statewide academic and governmental partners
- (10/2011 – 05/2012)

Research Assistant: *Healthy Bodies, Healthy Souls Study* (Principle Investigator: Joel Gittelsohn, PhD)

- Gained experience in an environmental-level obesity and chronic disease prevention program in an inner-city, church-based setting
- Designed and implemented intervention sessions based on formative research
- Collected and analyzed study data, and participated in preparation of manuscripts
- (06/2011 - 10/2011)

2013-2014 **Anne Arundel Community College**

Instructor, *HEALTH/BIOLOGY 137: Weight Management: Utilizing Healthy Approaches to Diet & Physical Activity*

- Developed course content and delivered class sessions
- Designed student evaluations via case studies, projects, and exams
- (11/2013-5/2014)

2013-2014 **Johns Hopkins University**

Instructor, *AS.280.205.31: Whole Food vs. Junk Food: Access to Food in Baltimore City*

- Developed course content and taught a 10-day intensive course on controversial topics in public health nutrition and health disparities using Baltimore as a case study (course offered during winter and summer intersession programs)
- Coordinated students' field experiences with community-based nutrition and health organizations
- (10/2013 –9/2014)

- 2012-2013 **Johns Hopkins Bloomberg School of Public Health, Center for Human Nutrition**
Graduate Teaching Assistant, *PH.222.641.01 Principles of Human Nutrition*
(Instructor: Ben Caballero, MD) and *PH.222.654.01 Food, Culture, and Nutrition*
(Instructor: Joel Gittelsohn, PhD)
- Coordinated communication with course faculty and students, and managed course websites
 - Delivered supplemental lectures and laboratory sessions, administered and graded assessments
 - (08/2012-11/2013)
- 2011 **Johns Hopkins Hospital, Weight Management Center**
Research Dietitian (Principle Investigator: Larry Cheskin, MD)
- Assisted with the development of messaging for an innovative mHealth randomized control trial that provided weight loss counseling through text-message conversations
 - Conducted anthropometric measures of and provided diet counseling to participants
 - (06/2011 – 09/2011)
- 2007-2011 **University of Tennessee, Department of Nutrition**
Research Associate III (Principle Investigator: Hollie Raynor, PHD, RD, LDN)
- Served as project coordinator for multiple behavioral weight loss interventions
 - Hired, trained, and supervised a staff of 12 graduate and undergraduate student research assistants
 - Delivered research interventions in individual and group settings
 - Managed research databases for the laboratory
 - (09/2007 – 06/2011)
- 2007 **University of Tennessee, Department of Nutrition**
Dietetic Intern (Internship Director: Karen Wetherall, MS, RD, LDN)
- Commission on Accreditation for Dietetics Education (CADE) accredited internship
 - Completed specialty rotations in: clinical nutrition/medical nutrition therapy, pediatric and long term care nutrition, nutrition for disease states (diabetes, cardiac, renal, oncology), nutrition for metabolic support and trauma, bariatric surgery, and food service management
 - (01/2007 – 06/2007)
- 2006 **University of Tennessee, Department of Nutrition**
Graduate Teaching Assistant, *NUTR 100: Introductory Nutrition* (Instructor: James Bailey, PhD)
- Prepared and delivered weekly lectures
 - Managed student correspondence and conducted office hours
 - (01/2006 – 12/2006)

LEADERSHIP ACTIVITIES, SERVICE, & PROFESSIONAL ASSOCIATIONS:

2013-present	Policy and Advocacy Leader, Weight Management Practice Group of the Academy of Nutrition and Dietetics
2012-present	Member, Society for Behavioral Medicine
2012-present	Member, American Society for Nutrition
2012-present	Member, Community and Public Health Practice Group of the American Dietetic Association
2010-present	Member, Weight Management Practice Group of the American Dietetic Association
2010-2011	State Regulatory Specialist, Tennessee Affiliate of the American Dietetic Association
2010	Member, University of Tennessee Department of Nutrition Diversity Committee
2009-2011	Legislative Chair, Knoxville District Dietetic Association
2009-2011	Member, Child Nutrition Task Force of the Tennessee Dietetic Association
2004-2005	President, Student Dietetic Association, at the University of Dayton
2003-present	Member, American Dietetic Association

AWARDS & HONORS:

2013-2014	Johns Hopkins Bloomberg School of Public Health, Harry D. Kruse Fellowship in Nutrition Award
2013	Johns Hopkins Global Center on Childhood Obesity, Young Investigator Travel Award
2012-2015	Johns Hopkins Bloomberg School of Public Health, Center for Human Nutrition Student Travel Award
2012	Academy of Nutrition and Dietetics Foundation, Doctoral Scholarship
2011	Knoxville District Dietetic Association, Recognized Young Dietitian Award
2008	Knoxville District Dietetic Association, Outstanding Student in Dietetics Award Nomination
2008	American Dietetic Association, Certificate of Training in Adult Weight Management
2007	University of Tennessee, Certificate of Training in Cultural Competence
2006-2007	University of Tennessee, College of Education, Health, and Human Sciences: Jane R. Savage Scholarship
2005	University of Dayton, Elizabeth L. Schroeder Award of Excellence to an Outstanding Senior in Dietetics
2001-2007	National Society of Collegiate Scholars

SELECT RESEARCH PRESENTATIONS:

1. Presentation. **Anderson Steeves E**, Hopkins L, Grasso A, Eastman K, Gittelsohn J. "Food Purchasing Among Low-Income, African American Adolescents in Baltimore City: What, Where, and How Often are they Buying Food?" *International Society for Behavioral Nutrition and Physical Activity*. May 21-24, 2014. San Diego, CA
2. Presentation. **Anderson Steeves E**, Hopkins L, Henry J, Kharmats A, Gittelsohn J. "Social Support for Healthy and Unhealthy Eating among Low-income, African American Adolescents in Baltimore City." *Society of Behavioral Medicine*. April 23-26, 2014. Philadelphia, PA
3. Oral Presentation: **Anderson Steeves E**. "Food Purchasing Among Low-Income African American Adolescents in Baltimore City: What, Where, and How Often are they Buying Food?" *Association of Maternal and Child Health Programs Annual Meeting*. January 25-26, 2014. District of Columbia
4. Presentation: **Anderson Steeves E**, Shin A, Coutinho A, Gittelsohn J. "Impact of a Multi-level, Cluster-randomized Environmental Obesity Intervention for Youth in Baltimore City." *Obesity Week*. November 12-16, 2013. Atlanta, GA
5. Presentation: **Anderson Steeves E**, Rowan M, Penniston E, Thomas L, Gittelsohn J. "A Rural Small Food Store Intervention Improves Healthy Food Availability: Results of the Maryland Healthy Stores Pilot." *Experimental Biology 2013*. April 20-24, 2013. Boston, MA
6. Presentation: **Anderson Steeves E**, Johnson KA, Pollard S, Gittelsohn J. "Influences on Healthy Eating Among Low-Income African American Adolescents, Perspectives of Youth and Adult Caregivers." *Society of Behavioral Medicine*. March 20-23, 2013. San Francisco, CA
7. Oral Presentation: **Anderson Steeves E**. "B'More Healthy: Communities for Kids: Study Design and Formative Research Findings." *Chesapeake Region Society of Adolescent Health and Medicine Quarterly Meeting*. November 2, 2012. Columbia, MD
8. Presentation: **Anderson Steeves E**, Shin AH, Wang HE, Newsome T, Gittelsohn J. "Faith, Food, and Fitness: Results of the Healthy Bodies, Healthy Souls Study." *American Diabetes Association 5th Annual Conference on Health Disparities*. October 22, 2012. District of Columbia
9. Oral Presentation: **Anderson E**, Hansen-Petrik M. "An Evaluation of the Education, Qualifications, and Functions of School Food Service Directors in Tennessee Public Schools." *University of Tennessee, College of Education, Health and Human Sciences, Graduate Research Colloquium*. March 19, 2006. Knoxville, TN
10. Presentation: **Anderson E**, Hansen-Petrik, M. "An Evaluation of the Education, Qualifications, and Functions of School Food Service Directors in Tennessee Public Schools." *Tennessee Dietetic Association Annual Meeting*, March 29, 2006. Nashville, TN

INVITED PRESENTATIONS:

- University of Wisconsin- Milwaukee, Kinesiology 241: - "Why We Eat What We Eat": Guest Lecturer on the influence of the food environment on dietary intake.
- Johns Hopkins School of Medicine, "Health Care Disparities" Intersession Course: - Guest Lecturer on health disparities associated with Baltimore City food systems and the food environment.
- Johns Hopkins Bloomberg School of Public Health, Public Health 654: - "Food Culture and Nutrition": Guest lecturer on the role of individual and household-level characteristics in community nutrition interventions.
- University of Tennessee, Kinesiology 623: - "Advanced Topics in Obesity": Guest lecturer on medical nutrition therapy for the treatment of obesity.

PUBLICATIONS:

**Note: Authorship for publications is listed under Anderson, Steeves, or Anderson Steeves
Peer Reviewed Manuscripts*

1. Raynor H, Looney S, **Steeves EA**, Spence M, Gorin A. The Effects of an Energy Density Prescription on Diet Quality and Weight Loss: A Pilot Randomized Control Trial. *J Academy of Nutrition and Dietetics (formerly J Am Diet Assoc)*. 2012;112(9): 1397-1402
2. Raynor H, **Steeves EA**, Hecht J, Fava J, & Wing R. Limiting Variety of Snack Foods During A Lifestyle Intervention: A Randomized Control Trial. *Am J of Clin Nutr*. 2012; 95(6): 1305-1314
3. **Anderson Steeves E**, Silbergeld E, Summers A, Chen L, Gittelsohn J. Risky Food Safety Behaviors are Associated with Higher BMI and Lower Healthy Eating Self-Efficacy Among African American Churchgoers in Baltimore City. *PLoS ONE*. 2012;7(12):e52122.
4. LaRose JG, Fava J, **Steeves EA**, Hecht J, Wing R, Raynor H. Daily Self-weighing within a Lifestyle Intervention: Impact on Disordered Eating Symptoms. *Health Psychology*. 2014 Mar;33(3):297-300. doi: 10.1037/a0034218
5. Wang HE, Lee M, Hart A, Summers AC, **Anderson Steeves E**, Gittelsohn J. Process Evaluation of Healthy Bodies, Healthy Souls: A Church-Based Health Intervention Program in Baltimore City. *Health Education Research*. 2013; 28(3):392-404.
6. Silbergeld E, Frisancho JA Gittelsohn J, **Anderson Steeves E**, Frisancho A, Blum M, Resnick C. Food Safety and Food Access: A Pilot Study. *J Food Research*. 2013;2(2): 108-119.
7. Raynor HA, **Anderson Steeves E**, Bassett DR, Thompson DL, Gorin A, Bond D. Reducing TV Watching During Adult Obesity Treatment: Two Pilot Randomized Controlled Trials. *Behavior Therapy*. 2013;44:674-685.
8. Rider BC, Bassett DR, Thompson DL, **Anderson Steeves E**, Raynor H. Research Capabilities of the Omron HJ-720ITC Pedometer. *Physician and Sport Medicine*. 2014;42(1): 24-29.
9. Coakley H, **Anderson Steeves E**, Jones-Smith J. Hopkins L, Braunstein NS, Mui Y, Gittelsohn J. Where Do Low-Income Children Get Food? Combining Ground-Truthing and Technology to Improve Accuracy of Children's Food Purchasing Behaviors. *Journal of Hunger and Environmental Nutrition*. 2014; 418-430. Doi. 10.1080/19320248.2014.898173
10. Gittelsohn J, **Anderson Steeves E**, Mui Y, Kharmats AY, Hopkins LC, Dennis D. B'more Healthy Communities for Kids: Design of a multi-level intervention for obesity prevention for low-income African American children. *BMC Public Health*. 2014;14(1):942.
11. **Anderson Steeves E**, Martins PA, Gittelsohn J. Changing the Food Environment for Obesity Prevention: Key Gaps and Future Directions. *Current Obesity Reports*. *Curr Obes Rep*. 2014 Dec;3(4):451-458. 13.
12. **Anderson Steeves E**, Penniston E, Rowan M, Steeves J, Gittelsohn J. Trends Toward Improving Healthy Food Availability in a Rural Small Food Store Pilot Intervention. *J of Hunger Environ Nutr (accepted for publication September 2014)*.
13. Gudzone K, Welsh C, Lane E, Chissel Z, **Anderson Steeves E**, Gittelsohn J. Increasing Access to Fresh Produce by Partnering Urban Farms with Corner Stores: A Pilot Study in a Low-income Urban Setting. *Public Health Nutr*. 2015 Feb 4:1-5.
14. Sattler M, Hopkins L, Hurley K, **Anderson Steeves E**, Gittelsohn J. Characteristics of Youth Food Preparation in Low-Income African American Homes: Associations to BMI and Contributions to Nutritional Intake. *Ecol Food Nutr*. 2015 Feb 23:1-17.
15. Kohlstadt IC, **Anderson Steeves ET**, Rice K, Gittelsohn J, Summerfield LM, Gadhoke P. Youth Peers Put the "Invent" into NutriBee's Online Intervention. *Nutrition Journal (accepted for publication April 2015)*.

Submitted Manuscripts

1. Johnson KA, **Anderson Steeves E**, Gewanter ZR, Gittelsohn J. "Food in My Neighborhood": Using Photovoice to Elicit Adolescent's Perspectives on Food Access. (*Under review by Progress in Community Health Partnerships: Research, Education, and Action*)
2. **Anderson Steeves E**, Jones Smith J, Hopkins L, Gittelsohn J. Perceived Social Support from Friends and Parents for Dietary Behavior and Quality among Low-income, Urban Minority Youth. (*Under review by the Journal of Nutrition Education and Behavior*)
3. Vedovato GM, Surkan PJ, Jones-Smith J, **Steeves EA**, Han E, Trude ACB, Kharmats AY, Gittelsohn J. Food insecurity, overweight and obesity among low-income African-American families in Baltimore City: Associations with food-related perceptions. (Under review by Public Health Nutrition)
4. Han E, Jones-Smith JC, Surkan PJ, Kharmats AY, Vedovato GM, Trude AC, **Anderson Steeves E**, Gittelsohn J. Low-income African American adults share weight status, food-related psychosocial factors and behaviors with their children. (Under review by Obesity)
5. Hopkins L, Sattler M, Jones-Smith J, **Anderson Steeves E**, Gittelsohn J. Associations between Breakfast Consumption Compared and Overall Diet Quality using the HEI 2010 among Adolescents in a Low-Income Urban Setting. (*Under by the Journal of Nutrition Education and Behavior*)
6. Yamaguchi M, **Anderson Steeves E**, Shipley C, Hopkins LC, Cheskin L, Gittelsohn J. Inaccuracy of self-reported energy intake predicts obesity among poor, urban, African-American children. (*Under Review by PLoS ONE*)
7. **Anderson Steeves E**, Johnson K, Pollard S, Jones Smith J, Pollack K, Lindstrom-Johnson SL, Hopkins LC, Gittelsohn J. Social influences on healthy eating of urban, low-income, African American, early adolescents. (*Under review by the Journal of Mixed Methods Research*)

Manuscripts In Preparation

1. **Anderson Steeves E**, Shipley C, Hopkins L, Jones-Smith J, Pollack K, Cheskin L, Gittelsohn J. Process and Impact of a Youth-leader Intervention for Child Obesity Prevention. (*Under internal review*)

Abstracts

1. Bachman J, Raynor H, **Anderson E**. "Eating Frequency is related to Energy Intake During an Adult Behavioral Weight Loss Intervention." *Experimental Biology 2010*. April 24 – 28, 2010. Anaheim, CA
2. Raynor H, Looney S, **Anderson Steeves E**, Spence M, Gorin A. "The Effect of a Dietary Energy Density Prescription on Dietary Quality, Restriction, and Weight Loss." *The Obesity Society 2011*. October 1-4, 2011. Orlando, FL
3. Raynor H., **Anderson Steeves E.**, Hecht J., Wing R. "Does Limiting Variety in Snack Foods Assist with Reducing Energy Intake and Weight Loss During a Lifestyle Intervention?" *The Obesity Society 2011*. October 1-4, 2011. Orlando, FL
4. Gokee LaRose J, Fava J, **Steeves E**, Hecht J, Wing R, Raynor H. "Daily Self-weighing within a Behavioral Weight Loss Program: Impact on Disordered Eating Symptoms." *Society for Behavioral Medicine 2012*. April 11-14, 2012. New Orleans, LA
5. Raynor H, **Anderson Steeves E**, Hecht J, Gokee LaRose J, Wing R. "The Relationship between Dietary Energy Density and Body Mass Index during an 18-month Lifestyle Intervention" *The Obesity Society 2012*. September 20-24, 2012. San Antonio, TX
6. Gudzone KA, Welsh C, Lane E, Chissell Z, **Anderson E**, Gittelsohn J. "Increasing Access to Fresh Produce by Partnering Urban Farms with Corner Stores: A Pilot Study in a Low-income Urban Setting." *Experimental Biology 2013*. April 20-24, 2013. Boston, MA

7. Coakley H, Zablotny A, Cheah YS, Mui Y, **Anderson Steeves E**, Glass G, Hackman A, Gittelsohn J. "Where Do Children Get Food? Building a Searchable, Visual Database of Food Sources Through Ground-truthing." *Experimental Biology 2013*. April 20-24, 2013. Boston, MA
8. Johnson KA, Pollard SL, **Anderson Steeves E**, Gittelsohn J. "Strategies to Promote Healthful Diets Among Low SES, Urban, African American Adolescents: Individual and Household Level Research." *Experimental Biology 2013*. April 20-24, 2013. Boston, MA
9. Raynor H, **Anderson Steeves E**, Hecht J, Martin CK. "Limiting Variety of Non-nutrient-dense, Energy-dense Foods: Changes in Cravings during an 18-month Lifestyle Intervention" *Obesity Week 2014*. November 2-7, 2014. Boston, MA
10. Gittelsohn J, **Anderson Steeves E**. "Why do Community Interventions Work Differently in Boys and Girls?" *Obesity Week 2014*. November 2-7, 2014. Boston, MA

Book Chapters

1. Raynor H, **Anderson Steeves E**. Chapter: Strategies for Weight Loss Maintenance. In B. Caballero (Ed.), *The Encyclopedia of Human Nutrition 3rd ed.* Oxford: Elsevier Ltd., 2013.
2. VanWalleghen E, **Steeves EA**, Raynor HA. Chapter 29: Obesity. In H. S. Friedman (Ed.), *The Oxford Handbook of Health Psychology*. New York: Oxford University Press, 2011.

FUNDING:

General Mills Champions for Healthy Kids Grant

09/01/13-09/01/14

B'More Healthy Communities for Kids, Youth-leader Development

This award was granted in combination with our community partner organization, New Lens of Baltimore. The purpose of the funding is two-fold: (1) to train youth to become peer-leaders to deliver nutrition programming in Baltimore City Recreation Centers, and (2) to work collaboratively with youth-leaders to develop youtube videos promoting healthy eating among adolescents.

Role: Primary Academic Partner

Academy of Nutrition and Dietetics/Pepsico Healthy Lifestyles Innovation Grant

11/01/13-11/01/14

B'More Healthy Communities for Kids, Youth-leader Implementation

This grant provides funding support for implementing a peer-led nutrition curriculum focusing on promotion of healthy breakfast within the context of the B'More Healthy Communities for Kids study.

Role: PI

Johns Hopkins Urban Health Institute, Small Grants Program

09/01/12-09/30/13

'Food in My Neighborhood': A Photovoice Project

This funding supported a pilot photovoice program with youth ages 10-14 years old in two Baltimore City Recreation Centers. The photovoice program explored youths' dietary intake and perceived access to food through the theme of "Food in my neighborhood".

Role: Co-PI